

Gov. Doc  
Can

Canada Hydrographic and Map Service

1958



1958

LIBRARY

MAY 27 1958

UNIVERSITY OF TORONTO

3 1761 10818723 8

# GREAT LAKES PILOT

(VOLUME 1)

LAKE ONTARIO, LAKE ERIE,

AND

LAKE ST. CLAIR

(KINGSTON HARBOUR TO SARNIA)

FOURTH EDITION

ISSUED BY

THE CANADIAN HYDROGRAPHIC SERVICE  
SURVEYS AND MAPPING BRANCH  
DEPARTMENT OF MINES AND TECHNICAL SURVEYS  
OTTAWA

---

Obtainable from Department of Mines and Technical Surveys, Ottawa,  
or Superintendent of Publications, The Queen's Printer, Ottawa.

---

EDMOND CLOUTIER, C.M.G., O.A., D.S.P.  
QUEEN'S PRINTER AND CONTROLLER OF STATIONERY  
OTTAWA, 1958

Price: \$2.50











Digitized by the Internet Archive  
in 2024 with funding from  
University of Toronto

<https://archive.org/details/31761108187238>

1958



1958

# GREAT LAKES PILOT (VOLUME 1)

## Lake Ontario, Lake Erie,

AND  
LAKE ST. CLAIR

(KINGSTON HARBOUR TO SARNIA)

## FOURTH EDITION

ISSUED BY

THE CANADIAN HYDROGRAPHIC SERVICE  
SURVEYS AND MAPPING BRANCH

DEPARTMENT OF MINES AND TECHNICAL SURVEYS  
OTTAWA

Obtainable from Department of Mines and Technical Surveys, Ottawa, or Superintendent of Publications, The Queen's Printer, Ottawa.

EDMOND CLOUTIER, C.M.G., O.A., D.S.P.  
QUEEN'S PRINTER AND CONTROLLER OF STATIONERY  
OTTAWA, 1958

The following descriptions and directions, published under the authority of the Government of the Dominion of Canada, form the fourth edition of the "Great Lakes Pilot, Volume I, Lake Ontario, Lake Erie, and Lake St. Clair".

This edition, prepared by Capt. C. J. Angus, is compiled from Canadian information, supplemented by the latest United States charts and publications. This work embodies all "Notices to Mariners", referring to the district, up to and including No. 3 of 1958.

Pilots, masters or others interested are earnestly requested to furnish information regarding newly discovered dangers, changes in aids to navigation, the existence of new shoals or channels, errors in publications or other information that, it is considered, would be useful for the correction of Nautical Charts and Hydrographic Publications affecting Canadian waters, addressed to the

DOMINION HYDROGRAPHER, CANADIAN HYDROGRAPHIC SERVICE,  
SURVEYS AND MAPPING BRANCH  
DEPARTMENT OF MINES AND TECHNICAL SURVEYS,  
No. 8 TEMPORARY BUILDING,  
OTTAWA, CANADA

## CONTENTS

	<b>PAGE</b>
Advertisement, bearings, depths, datums, etc. Conversion tables, metres, feet. Table of distances at which objects can be seen at sea. Table of distances between points on Great Lakes. Table of distances between points on Lake Ontario and St. Lawrence River. Table of distances between points on Lakes Erie and St. Clair, Detroit and Niagara Rivers. Notes concerning charts, aids to navigation, variation of the compass, use of oil, etc. Lights, buoyage and signal systems. Radio aids to navigation service. Meteorological service. Storm signal stations. Regulations for operating swing spans of railway bridges. Regulations for oil tankers and vessels carrying inflammable liquids. Regulations for vessels entering the canals of Canada. Lake Ontario.—Dimensions, elevations, general notes.....	iv-xxviii
<b>CHAPTER I</b>	
LAKE ONTARIO—KINGSTON AND TIBBETTS POINT TO MAIN DUCK ISLAND AND RIDEAU CANAL.....	1-31
<b>CHAPTER II</b>	
LAKE ONTARIO—BAY OF QUINTE, MURRAY CANAL, TRENT-SEVERN WATERWAY.....	32-51
<b>CHAPTER III</b>	
LAKE ONTARIO—FALSE DUCKS ISLANDS TO PRESQU'ILE BAY.....	52-58
<b>CHAPTER IV</b>	
LAKE ONTARIO—PRESQU'ILE BAY TO TORONTO.....	59-74
<b>CHAPTER V</b>	
LAKE ONTARIO—TORONTO TO HAMILTON.....	75-83
<b>CHAPTER VI</b>	
LAKE ONTARIO—HAMILTON TO NIAGARA FALLS.....	84-90
<b>CHAPTER VII</b>	
WELLAND SHIP CANAL.....	91-110
<b>CHAPTER VIII</b>	
NIAGARA RIVER—NIAGARA FALLS TO LAKE ERIE.....	111-118
<b>CHAPTER IX</b>	
LAKE ERIE—PORT COLBORNE TO LONG POINT.....	119-131
<b>CHAPTER X</b>	
LAKE ERIE—LONG POINT TO POINT PELEE.....	132-139
<b>CHAPTER XI</b>	
LAKE ERIE—POINT PELEE TO DETROIT RIVER.....	140-148
<b>CHAPTER XII</b>	
DETROIT RIVER.....	149-165
<b>CHAPTER XIII</b>	
LAKE ST. CLAIR.....	166-171
<b>CHAPTER XIV</b>	
ST. CLAIR RIVER.....	172-185
INDEX.....	187

81167200

## NOTICE

**BEARINGS** in this work are true, unless otherwise stated, and where given in degrees, they are reckoned clockwise from  $000^{\circ}$  (NORTH) to  $359^{\circ}$ .

**Bearings of lights** are given from **seaward**.

**DEPTHES** are given below **chart datum level**, where not otherwise stated.

**DISTANCES**.—To avoid any possible confusion with the system adopted in the United States Government Sailing Directions for the lakes, the distances in this work are given in statute or land miles of 1,760 yards, ( $1,609^{\text{m}}3$ ), eight of which are approximately equivalent to seven nautical miles of 2,025 yards ( $1,851^{\text{m}}7$ ), as represented on the east and west margins of the charts. The longer distances, however, have the equivalents in nautical miles bracketed with them.

**A cable's length** is assumed to be equal to the tenth part of a sea mile, 100 fathoms or 200 yards ( $182^{\text{m}}9$ ). It is often accepted as being one tenth of a nautical mile of 6,080 feet.

**HEIGHTS** on the land are given in feet above the datum of the chapter referred to.

For the **Variation**, the chart should be consulted.

The **DATUMS** for the depths and soundings mentioned in this volume are as follows:—

For **Lake Ontario**, the soundings are reduced to the Standard Low Water Datum adopted by Canada, which is 243.0 feet ( $74^{\text{m}}1$ ) above Mean Sea Level.

For the **Upper Niagara River** and **Lake Erie**, the soundings are reduced to the Standard Low Water Datum adopted by Canada, which is 570.5 feet ( $173^{\text{m}}8$ ) above Mean Sea Level.

For the **Detroit River**, the soundings are reduced to the sloping surface of the river, corresponding to a Lake Erie elevation of 570.5 feet ( $173^{\text{m}}8$ ) and a Lake St. Clair elevation of 573.5 feet ( $174^{\text{m}}8$ ) above Mean Sea Level which are the Standard Low Water Datums adopted by Canada.

For **Lake St. Clair**, the soundings are reduced to the Standard Low Water Datum adopted by Canada which is 573.5 feet ( $174^{\text{m}}8$ ) above Mean Sea Level.

For the River St. Clair, the soundings are reduced to the sloping surface of the river, corresponding to a Lake St. Clair elevation of 573.5 feet ( $174^{\text{m}}8$ ) and a Lake Huron elevation of 578.5 feet ( $176^{\text{m}}4$ ) above Mean Sea Level, which are the Standard Low Water Datums adopted by Canada.

**Soundings** shown on some charts are in some cases for the actual depths found at the time of the surveys; and the depths are given as below the water surface elevations of those years. On these charts there is a **correction to soundings**, which must be applied to reduce the original soundings to depths below the present day Standard Low Water Datum.

**Note.—Lake level datums** to which soundings are reduced are given in the title of the chart. Latest recorded elevations for the lakes are given in the Monthly Bulletin issued by the Canadian Hydrographic Service.

## CONVERSION TABLE

FATHOMS TO METRES

Fathoms	Metres	Fathoms	Metres	Fathoms	Metres
$\frac{1}{4}$	0.5	$3\frac{3}{4}$	6.9	$7\frac{1}{2}$	13.7
$\frac{1}{2}$	0.9	4	7.3	8	14.6
$\frac{3}{4}$	1.4	$4\frac{1}{4}$	7.8	$8\frac{1}{2}$	15.5
1	1.8	$4\frac{1}{2}$	8.2	9	16.5
$1\frac{1}{4}$	2.3	$4\frac{3}{4}$	8.7	10	18.3
$1\frac{1}{2}$	2.7	5	9.1	20	36.6
$1\frac{3}{4}$	3.2	$5\frac{1}{4}$	9.6	30	54.9
2	3.7	$5\frac{1}{2}$	10.1	40	73.2
$2\frac{1}{4}$	4.1	$5\frac{3}{4}$	10.5	50	91.4
$2\frac{1}{2}$	4.6	6	11.0	60	109.7
$2\frac{3}{4}$	5.0	$6\frac{1}{4}$	11.4	70	128.0
3	5.5	$6\frac{1}{2}$	11.9	80	146.3
$3\frac{1}{4}$	5.9	$6\frac{3}{4}$	12.3	90	164.6
$3\frac{1}{2}$	6.4	7	12.8	100	182.9

## FEET TO METRES

Feet	Metres	Feet	Metres	Feet	Metres
1.....	0.3	11.....	3.4	21.....	6.4
2.....	0.6	12.....	3.7	22.....	6.7
3.....	0.9	13.....	4.0	23.....	7.0
4.....	1.2	14.....	4.3	24.....	7.3
5.....	1.5	15.....	4.6	25.....	7.6
6.....	1.8	16.....	4.9	26.....	7.9
7.....	2.1	17.....	5.2	27.....	8.2
8.....	2.4	18.....	5.5	28.....	8.5
9.....	2.7	19.....	5.8	29.....	8.8
10.....	3.0	20.....	6.1	30.....	9.1

## Distance at Which Objects Can Be Seen at Sea

Table of distances at which objects can be seen at sea, according to their respective elevations and the elevation of the eye of the observer.

Heights in Feet	Distances in Statute or English Miles	Distances in Geographic or Nautical Miles	Heights in Feet	Distances in Statute or English Miles	Distances in Geographic or Nautical Miles
5.....	2.958	2.565	100.....	13.228	11.47
10.....	4.184	3.628	110.....	13.874	12.03
15.....	5.123	4.443	120.....	14.490	12.56
20.....	5.916	5.130	130.....	15.083	13.08
25.....	6.614	5.736	140.....	15.652	13.57
30.....	7.245	6.283	150.....	16.201	14.05
35.....	7.826	6.787	200.....	18.708	16.22
40.....	8.366	7.255	250.....	20.916	18.14
45.....	8.874	7.696	300.....	22.912	19.87
50.....	9.354	8.112	350.....	24.748	21.46
55.....	9.811	8.509	400.....	26.457	22.94
60.....	10.246	8.886	450.....	28.062	24.33
65.....	10.665	9.249	500.....	29.580	25.65
70.....	11.067	9.598	550.....	31.024	26.90
75.....	11.456	9.935	600.....	32.403	28.10
80.....	11.832	10.26	650.....	33.726	29.25
85.....	12.196	10.57	700.....	35.000	30.28
90.....	12.549	10.88	800.....	37.416	32.45
95.....	12.893	11.18	900.....	39.836	34.54
			1000.....	41.833	36.28

**Example.**—Cabot Head light seen just at the horizon, what is its distance from the observer, under ordinary conditions of the atmosphere?

Height of light according to the list of lights, 80 feet (24 <sup>m</sup> 4); distance visible according to above table.....	Statute Miles
	11.83
Add distance corresponding to height of observer's eye above lake level, say 15 feet (4 <sup>m</sup> 6).....	5.12
Distance of light from observer.....	16.95

## DISTANCES BETWEEN POINTS ON GREAT LAKES

EDITORIAL

Distances in these tables are expressed to the nearest even statute mile; fractions of  $\frac{1}{2}$  mile or more being taken as a full mile and those under the half dropped. The results are, therefore, at times inconsistent by 1 mile in their comparative differences. Thus, measured distances to two given points may differ uniformly by 0.8

Measurements are by the shortest marked or sail direct courses, starting (unless otherwise noted) from the main entrances between pierheads of breakwaters, or piers, or from the principal landings of open roadsteads. Where landings are appreciably remote from protected entrances, the appropriate further distances, if desired, may be ascertained from the harbour descriptions or from charts. Points in the tables are arranged in the order of their

The distance between any two points appears in the line extending horizontally from the point first in order in the list and in the column headed by the other point.

<sup>a</sup> From abreast east end of U.S. centre pier.  
<sup>b</sup> From foot of Grand River Ave.

DISTANCES BETWEEN POINTS ON LAKE ONTARIO AND ST. LAWRENCE RIVER

	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	
1	Port Huron <i>a</i>																																			
2	Port Colborne	670	661	631	604	600	589	584	570	559	552	540	519	513	508	511	492	479	466	450	441	406	401	361	363	333	351	346	361	423	451	465	474	498	493	306
3	Cape Vincent	364	355	325	298	294	283	278	264	253	246	234	213	207	202	203	186	173	160	144	135	100	95	55	37	27	45	39	55	117	145	159	163	192	187	
4	Sackets Harbour	178	169	139	112	108	97	91	78	66	60	48	27	20	16	19	24	45	51	67	78	101	106	169	186	160	160	154	134	89	69	59	49	26		
5	Osswego	204	195	165	138	117	123	117	103	92	86	74	53	46	36	56	61	78	88	112	165	191	165	164	158	138	88	64	52	41	15					
6	Little Sodus Bay	226	217	188	161	157	146	140	127	115	109	97	76	69	65	68	55	66	71	88	92	91	96	145	166	141	139	133	113	59	29	15				
7	Sodus Bay	235	236	207	180	176	165	159	146	134	128	116	95	88	84	87	72	80	86	83	74	77	81	124	145	118	118	112	92	35						
8	Rochester (Charlotte)	266	257	227	200	196	183	179	166	154	148	136	113	108	104	107	90	98	99	73	64	57	60	96	117	89	89	83	63	63						
9	Olcott	236	227	197	170	166	155	149	136	125	118	106	85	78	74	77	64	73	78	88	79	85	90	136	157	131	130	124	104	48	18					
10	Niagara-on-the-Lake	331	302	272	245	241	230	224	211	199	193	181	160	153	149	162	134	121	109	92	83	51	47	38	35	28	22	11	6							
11	Lewiston	337	327	298	271	267	256	250	237	225	219	207	186	179	175	178	160	147	134	117	108	72	69	36	45	17										
12	Port Weller	337	327	298	271	267	256	250	237	225	219	207	186	214	205	202	190	186	175	178	159	146	133	117	107	72	68	28	30							
13	Hamilton	362	353	324	297	282	282	276	262	251	244	232	211	205	202	204	185	169	156	140	131	94	88	30												
14	Toronto (east entrance)	337	328	298	271	267	256	250	237	226	219	207	186	180	175	179	160	142	129	112	103	65	60													
15	Port Hope	283	274	245	218	214	203	197	183	172	166	154	132	126	121	125	106	85	72	56	47	7														
16	Colborne	278	269	239	212	208	197	182	173	167	160	148	137	120	116	120	101	79	67	50	41															
17	Trenton	250	241	211	184	180	169	163	150	139	132	120	101	94	90	89	71	40	28	11																
18	Belleview	239	230	201	174	169	158	153	139	128	121	109	90	84	80	78	60	29	17																	
19	Deseronto	223	214	184	157	153	142	136	123	111	105	93	74	68	63	62	44	13	37																	
20	Picton	217	208	178	151	147	138	130	117	105	99	87	68	62	57	56	37																			
21	Kingston	181	171	142	115	110	100	94	80	69	62	50	32	25	21	19																				
22	Gananoque	162	163	124	97	92	81	76	62	51	44	32	18	11	10	4																				
23	Clayton	162	163	124	97	92	81	75	62	51	44	32	11																							
24	Thousand Island Park	159	150	120	93	89	78	72	59	47	41	29	8																							
25	Alexandria Bay	152	142	113	86	81	71	65	51	40	33	22																								
26	Brockville	130	121	92	65	60	49	44	30	19	12																									
27	Ogdensburg	118	109	80	53	48	37	32	18	7																										
28	Gatop canal	111	102	73	46	41	32	25	11																											
29	Rapide Plat canal	100	91	62	35	30	19	13																												
30	Farran Point canal	87	78	48	21	17	6																													
31	Cornwall canal	152	142	113	86	81	71	65	51	40	33	22																								
32	Cornwall	81	72	42	15	11	5																													
33	St. Regis	67	58	29																																
34	Soulanges canal	38	29																																	
35	Lachine canal	9																																		
36	Montreal	0																																		

DISTANCE BETWEEN POINTS ON LAKES ERIE AND ST. CLAIR, DETROIT, AND NIAGARA RIVERS

	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	
1	Port Colborne.....	201	146	109	89	52	18	41	33	22	25	65	92	104	130	160	180	190	198	204	204	213	227	219	227	229	234	244	292	278	267	281	287	294	306		
2	Port Huron <i>a</i> .....	111	167	212	228	167	291	341	333	222	292	253	226	213	188	170	152	144	140	133	116	122	116	101	87	79	77	73	62	75	49	39	27	19	12		
3	St. Clair.....	99	155	200	216	268	279	330	322	311	281	241	214	201	176	158	141	133	129	122	105	111	105	89	75	67	65	61	50	63	37	27	15	7			
4	Marine City.....	92	118	183	269	261	272	322	314	303	273	231	207	194	169	151	133	125	121	114	97	103	97	82	68	60	58	54	43	56	30	20	7				
5	Algonac.....	86	143	188	203	255	267	317	309	298	288	228	201	188	163	145	128	120	116	109	92	98	92	76	62	55	53	48	37	49	22						
6	St. Clair flats <i>b</i> .....	72	129	174	180	241	253	303	295	284	280	275	281	280	272	261	231	191	164	174	149	131	114	106	102	95	78	84	78	62	48	41	39	34	23	35	15
7	Mt. Clemens.....	83	140	185	200	252	264	314	306	295	265	226	199	254	225	236	185	161	142	125	117	113	106	89	95	89	73	59	53	50	45	35	49				
8	Chatham.....	97	154	199	214	265	278	328	330	309	279	239	212	198	174	156	139	130	127	120	102	108	102	87	73	66	63	59	48								
9	Detroit (Woodward Ave.).....	49	106	151	166	217	230	280	272	261	231	191	164	150	126	108	91	82	79	72	54	60	54	39	25	18	15	11									
10	Trenton.....	34	91	136	151	203	215	265	257	246	216	177	149	136	111	93	76	68	64	57	40	46	40	24	10	13											
11	Wyandotte.....																																				
12	Amherstburg.....	31	88	133	148	200	212	262	254	243	213	173	146	133	108	90	73	64	61	54	36	42	36	21	7												
13	Detroit River light.....	24	81	126	141	193	205	255	247	236	206	166	139	126	101	83	66	58	54	47	30	36	30	14													
14	Monroe (piers).....	33	89	134	149	200	213	263	255	244	214	174	147	133	109	89	68	60	54	48	30	35	21														
15	Toldeo (river mouth).....	45	98	143	159	210	223	272	265	254	224	185	157	144	119	96	72	65	59	52	38	40															
16	Port Clinton.....	37	75	120	136	187	193	249	231	230	200	160	131	118	92	67	43	36	29	22	12																
17	Fuji-in-Bay.....	27	66	111	127	177	190	240	232	221	190	150	122	109	83	61	33	32	27																		
18	Sandusky (wharves).....	41	69	111	120	178	190	239	222	221	189	149	120	107	79	55	29	21	14																		
19	Huron.....	47	68	111	124	172	184	233	226	215	183	142	113	99	72	47	20	11																			
20	Vermilion.....	46	62	104	117	163	175	225	217	206	174	133	104	90	63	37	11																				
21	Lorain.....	48	57	97	109	154	166	215	208	197	164	124	95	80	53	28																					
22	Cleveland (main entrance).....	65	53	83	93	134	146	194	175	166	143	102	76	59	33																						
23	Fairport.....	83	48	62	66	104	116	165	157	146	114	73	44																								
24	Ashtabula.....	108	63	56	47	79	90	138	130	119	86	45	15																								
25	Conneaut.....	122	74	59	48	68	80	126	118	107	74	33																									
26	Erie.....	149	98	70	53	47	54	98	89	78	45																										
27	Dunirk.....	188	134	98	78	50	28	55	48	37																											
28	Buffalo.....	218	165	129	106	72	38	21	13																												
29	Tonawanda.....	230	174	137	117	83	49	8																													
30	Niagara Falls.....	237	182	145	125	90	57																														
31	Port Mayfield.....	187	132	95	75	37																															
32	Port Dover.....	175	120	83	62																																
33	Port Burwell.....	123	65	23																																	
34	Port Stanley.....	108	49																																		
35	Rondeau.....	63																																			
36	Kingsville.....	0																																			

x

*a* From foot of Grand River Ave.

*b* From south end of canal dike.

## NOTES CONCERNING CHARTS, LISTS OF LIGHTS, SAILING DIRECTIONS, AND ON SUBJECTS OF GENERAL INTEREST TO MARINERS

In the following general notes, acknowledgment of indebtedness must be made to the Admiralty publications of a similar nature. 5

A great amount of matter has been transcribed almost bodily from the above authorities.

The principal published guides to navigation—the Charts, the Sailing Directions, Tide and Current Tables, List of Lights and Fog Signals, List of Radio Stations—are all affected by the continual changes and alterations that 10 take place, and mariners and owners are cautioned to use only the latest and corrected official editions of these publications.

**All charts are corrected from the latest information received in the Hydrographic Office, to date of publication, or date of corrections, as given in the lower left-hand corner.** 15

The Light Lists and other guides mentioned above should be consulted for changes made after the chart was issued. The Sailing Directions, however, cannot from their nature be so corrected, and in all cases, where they differ from charts of later date, the latter must be taken as the guide.

**Corrections from Notices to Mariners.**—All small but important corrections, that can be made by hand, are published in "Notices to Mariners", and masters should at once place them on the charts to which they refer; when large corrections become necessary a new edition of the chart is issued. These new editions are issued principally because of changes in depths, channels, or in aids to navigation, and it is both dangerous and reprehensible to continue the use of the old charts. In some cases "correction patches" or "blocks" covering a small area are issued. They should be carefully placed in position on the chart affected. 20 25

In a communication with Hydrographic Offices concerning charts, the number of the chart (which will be found in the lower right-hand corner) should be 30 given, as well as the date of publication (found below the lower middle margin) and dates of corrections, that the edition referred to may be known.

The **Canadian Lists of Lights and Fog Signals** are published annually, about March 1, of each year. Alterations that take place after issue are notified to the public, and such alterations should be immediately noted in lists and on 35 charts.

The Lists of Lights should always be consulted as to the details of a light, as the description in the Sailing Directions or on the chart may be obsolete, in consequence of changes made since publication.

The publication of a new volume or a new edition of a volume of **Sailing Directions** and of Supplements is notified in Notices to Mariners. 40

When "Notices to Mariners" have accumulated since the last revision of the Sailing Directions, a supplement may be issued. This supplement will contain all notices issued and notes as to cancellation of certain portions of the edition of Sailing Directions to which they refer. Notations referring to the 45 Supplements should be made on the pages of the Sailing Directions affected.

Whenever Charts, Sailing Directions, or Lists of Lights are corrected by hand, a note to that effect should be written on margin with date and authority for the correction. Whenever reference is made to the Sailing Directions, the Supplement, if published, must be consulted. 50

## The use of Charts as Navigational Aids, and General Remarks Relating to Practical Navigation

1. *Accuracy of a Chart.*—The value of a chart must manifestly depend upon the accuracy of the survey on which it is based, and this becomes more 5 important the larger is the scale of the chart.

To estimate this, the date of the survey, which is always given in the title, is a good guide. Besides the changes that, in waters where sand or mud prevails, may have taken place since the date of the survey, the earlier surveys 10 were mostly made under circumstances that precluded great accuracy of detail, and, until a plan founded on such a survey is tested, it should be regarded with caution. It may, indeed, be said that, except in well frequented harbours and their approaches, no surveys yet made have been so minute in their examination of the bottom as to make it certain that all dangers have been found. The fullness or scantiness of soundings is another method of estimating the 15 completeness of a chart. When the soundings are sparse or unevenly distributed, it may be taken for granted that the survey was not made in great detail.

Close examination by sounding is the only method by which surveys on a large scale can generally be made, and in view of the vast mileage of surveys 20 yet requiring completion in the interests of navigation it would be a waste of time to undertake large scale coast surveys.

Blank spaces and irregular gaps among soundings on older charts mean that no soundings have been obtained in these spots. When the surrounding soundings are deep it may with fairness be assumed that in the blanks the water is also deep; but when they are shallow, or it can be seen from the rest 25 of the chart that reefs or banks are present, such blanks should be regarded with suspicion. This is especially the case off rocky coasts, and it should be remembered that in waters, where rocks abound, it is always possible that a survey, however complete and detailed, may have failed to find every small patch.

30 A wide berth should therefore be given to every rocky shore or patch, and *this rule should be invariably followed, viz., that instead of considering a coast to be clear unless it is shown to be foul, the contrary should be assumed.*

2. *Fathom Lines, a Caution.*—Except in plans of harbours that have been surveyed in detail, the six-fathom (11<sup>m</sup>0 line) (in some older editions the five-fathom (9<sup>m</sup>1 line) on most charts is to be considered as a caution or danger line 35 against unnecessarily approaching the shore or bank within that line, on account of the possibility of the existence of undiscovered inequalities of the bottom, which nothing but an elaborate detailed survey could reveal. In general surveys of coasts or of little frequented anchorages, the necessities of navigation do not 40 demand the great expenditure of time required for such a detailed survey. It is not contemplated that ships will approach the shores in such localities without taking special precautions.

The ten-fathom (18<sup>m</sup>3) line is, on rocky shores, another warning, especially for ships of heavy draught.

45 Charts, where no fathom lines are marked, must be specially regarded with caution, as it generally means that soundings were too scanty and the bottom too uneven to enable them to be drawn with accuracy.

Isolated soundings, shoaler than surrounding depths, should always be avoided, especially if ringed around, as there is no knowing how closely the 50 spot may have been examined.

On river and lake charts, those areas tinted blue should always be navigated with extreme caution, the colouring always indicating shoal and dangerous waters.

3. *Chart on largest scale always to be used.*—It sometimes happens that, from press of work, only the original plate of the larger scale chart of a particular locality can at once receive any extensive rearrangement of coastline or soundings. This is an additional reason, besides the obvious one of the greater detail shown on such chart, why largest scale charts should always be used for navigation. 5

4. *Caution in using Small Scale Charts.*—In approaching the land or dangerous banks, regard must always be had to the scale of the chart used. A small error in laying down a position means only yards on a large scale, whereas on a small scale the same amount of displacement means large fractions of a 10 mile. This is particularly to be observed when coming to anchor on a narrow ledge of convenient depth at some distance from the shore.

For the same reason, bearings to objects *near* should be used in preference to objects farther off, although the latter may be more prominent, as a small error in a bearing or in laying it down on the chart has a greater effect in mis- 15 placing the position the longer the line to be drawn.

5. *Buoys.*—It is manifestly impossible that any reliance can be placed on buoys always maintaining their exact positions. Buoys should therefore be regarded as warnings and not as infallible navigation marks, especially when in exposed positions; and a ship should always, when possible, be navigated by 20 bearings or angles on fixed objects on shore and not by buoys.

*Light-buoys.*—The lights shown by light-buoys cannot be implicitly relied on, as, if *occulting*, the apparatus may get out of order, or the light may be altogether extinguished. (See also page xx.)

6. *Lights.*—Circles drawn on charts around a light are not intended to give 25 information as to the distance at which it can be seen, but solely to indicate, in the case of lights which do not show equally in all directions, the bearings between which the variation, or visibility, or obscuration of the light occurs.

All the distances given in the Lists of Lights and on the charts for the visibility of lights are calculated for a height of an observer's eye of 15 feet (4<sup>m</sup>6). The tables of distances visible due to height, at the beginning of each List of Lights affords a means of ascertaining how much more or less the light is visible should the height of the observer's eye be more or less than 15 feet (4<sup>m</sup>6). The glare of a powerful light is often seen beyond the limit of visibility of the actual rays of the light, but this must not be confounded with the true 35 range. Again, refraction may often cause a light to be seen farther than under ordinary circumstances.

The intrinsic power of a light should always be considered, when expecting to make it in thick weather. A weak light is easily obscured by haze, and no dependence can be placed on its being seen. 40

Coloured lights are also inferior in power to bright or white lights, and are more quickly lost under unfavourable circumstances. In some conditions of the atmosphere, white lights may have a reddish hue. The mariner should not trust solely to colour, where there are sectors, but verify the position by taking a bearing on the light. On either side of the line of demarcation, between white and red, and also between white and green, there is always a small arc of uncertain colour. 45

The power of a light can be estimated by remarking its order, as given in the Lists of Lights, and in some cases by noting how much its visibility in clear weather falls short of the range due to the height at which it is placed. Thus, a light standing 200 feet (61<sup>m</sup>0) above the sea, and only recorded as visible at 50

10 miles in clear weather, is manifestly of little brilliancy, as its height would permit it to be seen over 20 miles, if of any power. (See table in Lists of Lights above mentioned.)

5 The distance from a light cannot be estimated either by its brilliancy or its dimness.

7. *Fog Signals.*—Sound is conveyed in a very capricious way through the atmosphere. Apart from wind, large areas of silence have been found in different directions and at different distances from the fog signal station, in some instances even when in close proximity to it. The apparatus, moreover, for 10 sounding the signal often requires some time before it is in readiness to act. A fog often creeps imperceptibly towards the land, and is not observed by the people at the station until it is upon them; whereas a ship may have been for many hours in it, and approaching the land. In such case no signal may be made. When sound has to travel against the wind, it may be thrown upwards; 15 in such a case, a man aloft might hear it when it is inaudible on deck. Under certain conditions of the atmosphere, when a fog signal is a combination of high and low notes, one of the notes may be inaudible.

The mariner should not assume—

20 (a) That he is out of normal range of audibility, because he fails to hear the sound.  
 (b) That because he hears a fog signal faintly, that he is at a great distance from it.  
 (c) That he is near it, because he hears the sound plainly.  
 (d) That the distance from and the intensity of the sound on any one occasion is a guide to him for any future occasion.  
 25 (e) That the fog signal has ceased sounding, because he does not hear it even when in close proximity.

Taken together, these facts should induce the utmost caution in closing the land in fogs, and the use of soundings should not be neglected.

30 8. *Fixing Position.*—The most accurate method of fixing a position relative to the shore is by angles taken by the sextant between well defined objects and laid down on the chart by station pointer.

35 Three things are, however, necessary to its successful employment. First, that the objects be well chosen; second, that the observer is skilful and rapid in his use of the sextant, and third, that the chart being used is from an accurate survey.

For the first, reference can be had to the pamphlet on the use of the station pointer, the second can only be obtained by practice. The third can be judged by the data in the title.

40 In many narrow waters also, where the objects may yet be at some distance, as in coral harbours or narrow passages among mud banks, navigation by sextant and station pointer is invaluable, as a true position can only be obtained by their means. A small error in either taking or plotting a compass bearing under such circumstances may put the ship ashore.

45 It is not intended that the use of the compass to fix the ship should be given up; there are many circumstances in which it may be usefully employed, but errors more readily creep into a position so fixed. Angles should invariably be used in all cases where great accuracy of position is desired, such as the fixing of a rock or shoal, or of additions to a chart, such as fresh soundings or new 50 buildings. In these cases angles should be taken to several objects, the more the better; but five objects is a good number, as the four angles thus obtained not only prevent any errors, but they at once furnish a means of checking the accuracy of the chart itself.

Sometimes, when only two objects are visible, a compass bearing and a sextant angle may be used with advantage.

The use of a danger angle in passing outlying rocks with land behind should not be forgotten. In employing this method, however, caution is necessary, as should the chart not be accurate, i.e., should the objects selected be not quite correctly placed, the angle taken off from it may not serve the purpose. It should not, therefore, be employed when the survey is old or manifestly imperfect.

In fixing by the compass, it must always be remembered that two-bearing fixes are liable to error. An absolute error may be made in either bearing observed; errors may be made in applying the deviation; or errors may creep in in laying them on to the chart. For these reasons, a third or check bearing of some other object should be taken, especially when near the shore or dangers. The coincidence of these three lines will prevent any mistakes.

In passing near a point of land, or an island or any conspicuous object, 15 the method of fixing by doubling the angle on the bow is invaluable. The ordinary form of it, the so-called "four-point bearing," when the bearing is taken four points on the bow, and on the beam, the distance from the object at the latter position being the distance run between the times of taking the bearings, gives an excellent fix for a departure, but does not ensure safety, as the 20 point, and probably the rocks off it, are abeam before the position is obtained.

Doubling the angle on the bow cannot be used in its simple form, if there is any tidal stream, current or leeway across the course, that is, if the course made good is not the course steered. If this happens, the observations must be plotted 25 as a running fix.

By taking the bearings of an object with two and four points, three and six points, or any doubled angle on the bow, and the distance made good in the interval, a very good position is obtained at the time of the second bearing—the distance from the object being, as with the "four-point" bearing equal to the 30 distance run. This method has an advantage over those following, in that no tables are necessary for the working out of the distance off at second bearing. Used in conjunction with the Traverse table, the distance the ship will pass off the object when abeam can be obtained, as follows:—

Taking the degrees, or points, from bow at second bearing as a course, with the distance made good in distance column, in dep. column will be found the 35 distance the ship will pass off when abeam—provided the course is maintained.

The advantage of having this knowledge before coming up to a point is obvious.

Another method of obtaining the distance the ship will pass off an object is shown in the following table:

Angles on bow	Between $22^{\circ}$ and $34^{\circ}$	The distance made good will be distance ship will pass off.
	— $25^{\circ}$ — $41^{\circ}$	
	— $26\frac{1}{2}^{\circ}$ — $45^{\circ}$	
	— $32^{\circ}$ — $59^{\circ}$	
	— $37^{\circ}$ — $72^{\circ}$	
	— $45^{\circ}$ — $90^{\circ}$	
	— $45^{\circ}$ — $63\frac{1}{2}^{\circ}$	

the distance made good will be *half* the distance she will pass off.

A very useful table is here inserted. If two bearings of an object are taken, and the distance run in the interval between the two bearings (allowance being made for tide, etc.) is known, this distance, multiplied by the factors in the table will give the distance the ship is off at the second bearing, and will also give the distance the ship will pass when at her nearest, i.e., when abeam. This table can, of course, also be used to obtain distance from an object abaft the beam and so distance when object was abeam.

Example.—Course, North. Speed, 10 knots.

9.00 p.m. observed Tonken Lt. bearing NNE. patent log 18.0.

9.30 p.m. observed Tonken Lt. bearing NE. by E.  $\frac{1}{2}$ E. patent log 23.0.

Difference between course and first bearing is 2 points.

5 Difference between course and second bearing is  $5\frac{1}{2}$  points.

Distance run in the interval, 5 miles.

Under 2 (difference between course and first bearing) and in line with  $5\frac{1}{2}$  (difference between course and second bearing) will be seen the factors .60 and .53. Multiply these factors by distance run.

10 .60 x 5 = 3.0 m. distance from lighthouse at 2nd bearing.

.53 x 5 = 2.65 m. distance ship will pass off lighthouse when abeam *provided the course is maintained.*

It must be remembered that distance run is distance *made good*, and the course must be the same throughout.

15 When the object is abeam the vessel is at her nearest, therefore the smaller of the two results always gives the distance off the ship will be, or was, when abeam.

#### DISTANCE OF AN OBJECT BY TWO BEARINGS, AND DISTANCE RUN BETWEEN THEM

Difference in Points Between Course and Second Bearing	Difference in Points Between the Course and First Bearing					
	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$
3.	1.96	1.09				
$3\frac{1}{2}$ .	1.32	.84	2.42	1.53		
4.	1.00	.71	1.62	1.15	2.85	2.01
$4\frac{1}{2}$ .	.81	.63	1.23	.95	1.91	1.48
5.	.69	.57	1.00	.83	1.45	1.21
$5\frac{1}{2}$ .	.60	.53	.85	.75	1.18	1.01
6.	.54	.50	.74	.69	1.00	.92
$6\frac{1}{2}$ .	.50	.47	.67	.64	.88	.84
7.	.46	.45	.61	.60	.79	.77
$7\frac{1}{2}$ .	.43	.43	.57	.56	.72	.72
8.	.41	.41	.53	.53	.67	.67
$8\frac{1}{2}$ .	.40	.40	.51	.51	.63	.63
9.	.39	.38	.49	.48	.60	.59
$9\frac{1}{2}$ .	.38	.37	.48	.46	.58	.56
10.	.38	.35	.47	.44	.57	.52
$10\frac{1}{2}$ .	.38	.34	.47	.42	.56	.49
11.	.39	.32	.47	.39	.56	.46
$11\frac{1}{2}$ .	.40	.31	.48	.37	.56	.43
12.	.41	.29	.49	.35	.57	.40

	5	$5\frac{1}{2}$	6	$6\frac{1}{2}$	7	$7\frac{1}{2}$
6.	4.26	3.94				
$6\frac{1}{2}$ .	2.86	2.74	4.52	4.33		
7.	2.17	2.13	3.04	2.98	4.74	4.64
$7\frac{1}{2}$ .	1.76	1.76	2.30	2.29	3.18	3.17
8.	1.50	1.50	1.87	1.87	2.41	2.41
$8\frac{1}{2}$ .	1.31	1.30	1.59	1.58	1.96	1.95
9.	1.18	1.15	1.39	1.36	1.66	1.63
$9\frac{1}{2}$ .	1.08	1.03	1.25	1.19	1.46	1.39
10.	1.00	.92	1.14	1.05	1.31	1.21
$10\frac{1}{2}$ .	.94	.83	1.06	.94	1.20	1.05
11.	.90	.75	1.00	.83	1.11	.92
$11\frac{1}{2}$ .	.87	.67	.95	.73	1.05	.81
12.	.85	.60	.92	.65	1.00	.71

## DISTANCE OF AN OBJECT BY TWO BEARINGS, AND DISTANCE RUN BETWEEN THEM

	8	8½	9	9½	10	10½
9.....	5.13	5.03				
9½.....	3.44	3.30	5.10	4.88		
10.....	2.61	2.41	3.43	3.17	5.03	4.64
10½.....	2.12	1.87	2.60	2.29	3.38	2.98
11.....	1.80	1.50	2.11	1.76	2.56	2.13
11½.....	1.58	1.22	1.79	1.38	2.08	1.61
12.....	1.41	1.00	1.57	1.11	1.77	1.25
					2.03	1.44
					2.41	1.71
					3.04	2.15

11. *Change of Variation of the Compass.*—The gradual change in the variation must not be forgotten in laying down positions by bearing on charts. The magnetic compass roses placed on the charts for the purpose of facilitating plotting become in time slightly in error, and in some cases, such as with small scales, or when the lines are long, the displacement of position from neglect of this change may be of importance. 5

The change in the value of the variation is very rapid in some parts of the world, and should always be taken into consideration. For instance, in approaching Halifax from Newfoundland the variation changes  $10^{\circ}$  in less than 500 miles. 10

Therefore, when the true course between two positions crosses differing lines of variation, the compass course must be altered from time to time to allow for the changes due not only to time but to locality.

A variation chart should be consulted on this head, and the date and correction to apply to variation (always given in compass roses or in title) be 15 watched.

12. *Local Magnetic Disturbance of the Compass on board Ship.*—The term "local magnetic disturbance" has reference only to the effects on the compass of magnetic masses external to the ship in which it is placed. Observation shows that disturbance of the compass in a ship afloat is experienced only in a few 20 places on the globe. 20

Magnetic laws do not permit of the supposition that it is the visible land which causes such disturbance, because the effect of a magnetic force diminishes in such rapid proportion as the distance from it increases, that it would require a local centre of magnetic force of an amount absolutely unknown to affect a 25 compass half a mile distant.

Such deflections of the compass are due to magnetic minerals in the bed of the sea under the ship, and when the water is shallow, and the force strong, the compass may be temporarily deflected when passing over such a spot, but the area of disturbance will be small, unless there are many centres near together. 30

It is very desirable that, whenever a ship passes over an area of local magnetic disturbance, the position should be fixed, and the facts reported as far as they can be ascertained.

13. *Use of Oil for Modifying the Effect of Breaking Waves.*—Many experiences of late years have shown that the utility of oil for this purpose is 35 undoubted, and the application simple.

The following may serve for the guidance of seamen, whose attention is called to the fact that a very small quantity of oil, skilfully applied, may prevent much damage both to ships (especially the smaller classes) and to boats, by modifying the action of breaking seas. 40

The principal facts as to the use of oil are as follows:—

1. On free waves, *i.e.*, waves in deep water, the effect is greatest.
2. In a surf, or waves breaking on a bar, where a mass of liquid is in actual motion in shallow water, the effect of the oil is uncertain, as nothing can prevent 5 the larger waves from breaking under such circumstances; but even here it is of some service.
3. The heaviest and thickest oils are most effectual. Refined kerosene is of little use; crude petroleum is serviceable when nothing else is obtainable; but all animal and vegetable oils, such as waste oil from the engines, have 10 great effect.
4. A small quantity of oil suffices, if applied in such a manner as to spread to windward.
5. It is useful in a ship or boat, both when running or lying to, or in wearing.
- 15 6. No experiences are related of its use when hoisting a boat up in a seaway at sea, but it is highly probable that much time and injury to the boat would be saved by its application on such occasions.
- At anchor, when the sea is sufficient to render it difficult to hoist up or in boats, oil bags from forward or from the swinging booms have been found to 20 render the sea alongside comparatively smooth.
7. In cold water, the oil being thickened by the lower temperature, and not being able to spread freely, will have its effect much reduced. This will vary with the description of oil used.
- 25 8. The best method of application in a ship at sea appears to be: hanging over the side, in such a manner as to be in the water, small canvas bags, capable of holding from one to two gallons of oil, such bags being pricked with a sail needle to facilitate leakage of the oil.
- The position of these bags should vary with circumstances. Running before the wind they should be hung on either bow—*e.g.*, from the cathead—and 30 allowed to tow in the water.
- With the wind on the quarter the effect seems to be less than in any other position, as the oil goes astern while the waves come upon the quarter.
- 35 Lying to, the weather bow and another position farther aft seem the best places from which to hang the bags, with a sufficient length of line to permit them to draw to windward, while the ship drifts.
9. Crossing a bar with a flood tide, oil poured overboard and allowed to float in ahead of the boat which would follow with a bag towing astern, would appear to be the best plan. As before remarked, under these circumstances, the effect cannot be so much trusted.
- 40 10. On a bar, with the ebb tide, it would seem to be useless to try oil for the purpose of entering.
11. For boarding a wreck, it is recommended to pour oil overboard to windward of her before going alongside. The effect in this case must greatly depend upon the set of the current, and the circumstances of the depth of water.
- 45 12. For a boat riding in bad weather from a sea anchor, it is recommended to fasten the bag to an endless line rove through a block on the sea anchor, by which means the oil is diffused well ahead of the boat, and the bag can be readily hauled aboard for refilling if necessary.

12. Towing a vessel in a heavy sea, oil is of the greatest service and may prevent parting the hawser. Distribute from the towing vessel forward and on both sides; if used only aft, the tow gets all the benefit.

## LIGHTS, BUOYAGE AND SIGNAL SYSTEMS

**LIGHTS.**—All lights of the Dominion of Canada, under the control of the Department of Transport, are maintained in operation whenever navigation in the vicinity is open. Lights used solely as harbour lights are not exhibited when the harbour is closed, although the general navigation may remain open. Fishing lights are maintained only during the fishing season. In any case, where there is reasonable doubt whether the light is required, it is kept in operation.

5

10

**LIGHT-VESSELS.**—**Riding Lights.**—There is no uniformity of practice in regard to Canadian light-vessels carrying riding lights.

**BUOYAGE.**—The following system of buoyage is adopted in the waters of the Dominion of Canada:—

Approaching from seaward, all buoys on the **starboard** side of the channel are painted *red*, and if numbered, marked with even numbers, and must be left on the starboard hand.

15

Approaching from seaward, all buoys on the **port** side of the channel are painted *black*, and if numbered, marked with odd numbers and must be left on the port hand.

20

Numbers, when used, are in consecutive order commencing from seaward.

Buoys painted *red* and *black* in horizontal bands mark **middlegrounds**, and are left on either hand.

Buoys painted *white* and *black*, in vertical stripes mark **mid-channel**, or the **fairway**, and may be passed on either hand. These buoys are rarely used.

25

Pillar, light, bell, and whistle buoys mark special positions, a detailed description of which is given when the mark is first established.

Conical buoys, when used, are always on the **starboard** side of the channel; conical topmarks on starboard hand buoys, and cylindrical topmarks on port hand buoys. All starboard hand spar buoys have pointed tops and all port hand spar buoys have flat tops; otherwise the shapes of buoys have no special significance at present.

30

The rule for colouring buoys is also applicable to beacons and other day marks, so far as it may be practicable to carry it out.

The spar buoys in the rivers are swift current buoys, ballasted with iron rings to keep them upright.

35

**Caution.**—Buoys marking outlying dangers, owing to their exposed positions, are always liable to break adrift or to other accident; therefore implicit reliance should not be placed on their being in position.

**Buoyage season.**—Buoys in the Dominion are, generally speaking, maintained in position during the season of navigation. In localities where the lights are maintained in operation throughout the year, the buoys are always kept in position. In districts where navigation is closed in winter, the buoys are kept out in autumn until the last vessel has cleared, or as late as the ice will allow, with due regard to their safety. The buoys are replaced in the spring, as soon as the ice will permit.

40

45

**Caution.—Damaging floating lights.**—Masters of vessels who injure, alter, or make fast to any aid to navigation, render themselves liable to a fine of \$200. Any master of a vessel who, through unavoidable accident, has displaced any aid to navigation, must give notice of the same to the nearest Customs 5 officer, or be liable to a fine of \$50.

**WRECKS.**—Buoys, and the topsides of vessels used for marking wrecks, are painted *green* with a white inscription, and moored, when possible, near the side of the wreck next to mid-channel.

Wreck-marking vessels exhibit:—

10 By day.—Three balls from a yard, 20 feet (6<sup>m</sup>1) above the sea; two placed vertically on the side that shipping may safely pass and one on the other side.

By night.—Three *fixed white* lights, similarly arranged; the ordinary riding light is not shown.

15 Mariners must pass on that side of a wreck-marking vessel on which the two balls or two lights are shown.

## SIGNAL SYSTEMS

**Government stations for communication with shipping.**—The Government of Canada has in operation a system of communication between the shore and vessels navigating the Great Lakes.

20 **Radio Aids to Navigation.**—For full details mariners are referred to “Radio Aids to Marine Navigation” published three times annually; additions or alterations to the same will be contained in regular Notices to Mariners.

25 **Radio Coast Stations** on the Great Lakes are maintained at Kingston, Toronto, Cornwall, Welland Canal, Port Burwell, Sarnia, Midland, Sault Ste. Marie, Sault Ste. Marie Canal Lock, and Port Arthur. These stations also transmit weather forecasts and reports respecting dangers to navigation.

Messages to and from any of the radio stations pertaining to weather conditions and forecasts, and reports in aids to navigation will be handled without charge.

30 **Radio Beacons** are located at Main Duck Island, Gibraltar Point, Burlington Bay, and Port Weller, Lake Ontario; Port Colborne, Long Point and South East Shoal, Lake Erie.

35 **Radio Beacons (U.S.).**—Radio beacons are maintained by the United States Government at Rochester Harbour light, Tibbets Point, Sodus and Oswego west pierhead light on Lake Ontario, and at Detroit River light, Amherstburg Outer Channel light-buoy No. 1, Sandusky Bay, Erie Harbour, Fairport, Toledo Harbour, Ashtabula light, Cleveland west pierhead light, Buffalo light and South Buffalo South side light on Lake Erie.

(For the latest information referring to these stations consult “Notices to 40 Mariners, Great Lakes,” issued by the United States Coast Guard.)

45 **Special Operation of Radio Beacon Stations for Calibration of Direction Finders.**—United States radio beacons will broadcast for the purpose of enabling vessels to calibrate their radio direction finders upon request. If it is not practicable to determine the time of calibration sufficiently in advance to contact the District Commander, or if the calibration is desired from a remote station, where communication is difficult, request may be made directly to the attendant of the station by means of telephone, telegraph, or a whistle signal

consisting of three long blasts followed by three short blasts, this whistle signal to be repeated until same is acknowledged by the attendant, through the starting of the transmitter. The same group of signals will be sounded at the termination of the calibration. If attention of station or light-ship is not attracted by the whistle signals, hoist the international code signal, J over K, to indicate for 5 radio direction finder calibration.

The work of a station attendant is not confined to standing watch, and there may be times when the whistle request for calibration is not immediately heard, due to the noise from operating station machinery, etc. Usually, a repeated signal not too far from the station will attract the attention of keepers. 10

Transmission for calibration purposes will be continuous without the two-minute silent interval, unless another station in the same frequency group is in operation at the time. No continuous transmission for calibration will be undertaken during regular schedule periods of operation.

**Radiobeacon Charts of the Great Lakes.**—These charts, published by 15 the Treasury Department of the U. S. Coast Guard, are incorporated in their Great Lakes Light List, United States and Canada.

**Caution.**—The attention of mariners is directed to the serious dangers, which may arise from the misuse of radio fog signals and particularly to the risk of collisions with light-vessels operating such signals. The vagaries of 20 sound in fog are well known and warning regarding fog signals are embodied in the Sailing Directions and Light Lists. The mariner, who in thick weather approaches a radio fog signal directly ahead on a radio bearing, and relies on hearing the fog signal in sufficient time to alter course to avoid danger, is taking an unjustifiable risk. 25

Radio fog signals give no indication of distance off and safety demands that every precaution should be taken. If such signals are carried on light-vessels, risk of collision can be avoided by ensuring that the bearing does not remain constant.

**Interference to Direction-finding Equipment.**—It is pointed out to 30 masters of ships fitted with direction-finding equipment, particularly those using unshielded direction-finding loops, that serious error may result in bearings taken if, after calibration, broadcast receiving aerials are erected in proximity to the direction-finding equipment.

## METEOROLOGICAL SERVICE STORM SIGNAL STATIONS

35

In addition to the radio stations, from which vessels may obtain information regarding winds, weather, and ice upon request, storm signal stations are maintained at United States ports as described herein:—

### United States Weather Bureau storm warning signals.

**Small Craft Warning.**—One red pennant. Predicts winds dangerous to 40 small craft out of harbours. (Velocity of 25 to 35 miles per hour on shore.)

**Storm Warning.**—Two red pennants. Predicts winds dangerous to small and medium-sized craft out of harbours. (Velocity of 40 to 55 miles per hour on open lake; shore velocity 15 to 35 per cent lower, particularly on lee shores.)

**Gale Warning.**—Two square red flags with black centres. Predicts high 45 winds dangerous to all vessels out of harbour and to small craft in harbours. Displayed for expected open lake velocity in excess of 55 miles per hour with shore velocity 20 to 40 per cent lower, particularly on lee shores.

## LAKE ONTARIO STATIONS

**Fort Niagara, N.Y. (Niagara River).**—Steel tower, with lights.—At entrance of Niagara River, on northwest corner of the fort.

5 **Oswego, N.Y.**—Steel tower with lights.—On bluff 60 feet (18<sup>m</sup>3) above lake, and entrance to New York State Barge Canal.

**Rochester, N.Y.**—Steel tower.—At Coast Guard lifeboat station, east side of harbour entrance.

**Sodus Point, N.Y.**—Steel tower, with lights.—On the Pennsylvania Railroad grounds.

10

## LAKE ERIE STATIONS

**Ashtabula, Ohio.**—Steel tower.—At Coast Guard lifeboat station, on east side of river 700 feet (213<sup>m</sup>4) north of highway bridge.

15 **Buffalo, N.Y.**—Steel tower, with lights.—At Coast Guard lifeboat station on south pier at mouth of Buffalo River. Steel tower, with lights.—At Bethlehem Steel Co.'s Lackawanna plant, on ore dock next to ship canal, 2,000 feet (609<sup>m</sup>6) southeast of Buffalo Harbour south entrance.

**Cleveland, Ohio.**—Flagpole.—At the Coast Guard lifeboat station, near West Pier Light. Flagstaff.—At the Lakeside Yacht Club in the east harbour basin. Flagstaff.—At Northeast Yacht Club basin.

20 **Conneaut, Ohio.**—Steel tower, with lights.—On high bluff, 400 feet (121<sup>m</sup>9) west of dock No. 1.

**Dunkirk, N.Y.**—Steel tower, with lights.—On the shore in Memorial Park 500 feet (152<sup>m</sup>4) west of the city dock.

25 **Erie, Pa.**—Steel tower, with lights.—On public dock, State Street extension, 105 feet (32<sup>m</sup>0) from the outer end.

**Fairport, Ohio.**—Steel tower.—At Coast Guard life-boat station, west side of mouth of Grand River.

**Huron, Ohio.**—Steel tower, with lights.—At foot of Main Street, 90 feet (27<sup>m</sup>4) west from west shore of river.

30 **Kelleys Island, Ohio.**—Steel tower.—Near Newman's Ferry landing.

**Lorain, Ohio.**—Steel tower, with lights. On east side of Black River, near the Coast Guard life-boat station.

**Point Marblehead, Ohio.**—Steel tower, with lights.—At Coast Guard life-boat station, about 400 feet (121<sup>m</sup>9) south of lake shore line.

35 **Put-in-Bay, Ohio.**—Steel tower.—Head of pier at village park, lake front, 10 feet (3<sup>m</sup>0) west of intersection of Bay View and Hartford Avenues.

**Rocky River, Ohio.**—Flagstaff.—At Cleveland Yachting Club, on west side of river about 900 feet (274<sup>m</sup>3) southeast of Inner Light.

40 **Sandusky, Ohio.**—Steel tower, with lights.—On city dock at foot of Jackson Street. Flagstaff.—On breakwater at foot of Meigs Street.

**Toledo, Ohio.**—Day signals are displayed from a steel staff near the water-front on the west bank of Maumee River near the mouth, on grounds of the U. S. Coast Guard in Bay View Park.

**Vermilion, Ohio.**—Flagstaff.—At Vermilion Yacht Club, on east bank of river opposite the inner light and 500 feet (152<sup>m</sup>4) from the lake shore.

### DETROIT RIVER STATION

**Detroit, Mich.**—Flagstaff.—At Coast Guard life-boat station near Belle Isle Light, upper end of island. Detroit Boat Club.—Flagstaff.—At northwest corner of Belle Isle. 5

### LAKE ST. CLAIR STATIONS

**Gross Point Farms, Mich.**—Mast.—On club-house of Crescent Sail Yacht Club. Mast.—On Municipal Pier.

**Mount Clemens, Mich.**—Flagstaff.—At Gasow's boat livery, mouth of Clinton 10 River, and at Romich's boat livery, southwest corner of Belvidere Bay.

**Windmill Point, Mich.**—Flagstaff.—On upstream corner of Marine Hospital reservation.

### ST. CLAIR RIVER STATIONS

**Port Huron, Mich.**—Flagstaff.—At Fort Gratiot Coast Guard life-boat station, west side of head of river. 15

#### REGULATIONS FOR OPERATING SWING SPANS OF RAILWAY BRIDGES

The Board of Railway Commissioners of Canada has issued the following regulations governing the operation of swing spans of railway bridges in Canada.

(1) Every swing or drawbridge over a navigable water shall be marked at 20 night by a *white* light on each side of the navigable channel, by a *white* light on each side of the swing protection, and by a lantern surmounting the swing span showing a *red* light up and down the channel when the passage is closed and a *green* light when the swing is open.

(2) In the case of a bascule bridge of any description it will suffice that a 25 light showing *green* up and down a channel when the leaf or leaves are lifted, and a *red* light when the bridge is closed, be shown from one side or the other of the opening or preferably carried on the end of the leaf. The *white* lights above described for a swing bridge also to be maintained.

(3) The signal to be given by a steamer to have a swing opened shall be 30 *three long* whistles.

(4) No vessel shall pass through the bridge until the swing or draw is fully open.

**Regulation for oil tankers and vessels carrying flammable liquids.**—  
On oil tankers and similar vessels which, from time to time, carry flammable liquids on, in, or through any canal and which are not equipped with fixed timber fenders, there shall be provided and placed, when docking or locking, a sufficient number of timber fenders between the vessel's hull and the dock or lock wall to prevent any metallic portion of such vessel from touching the side of the dock or lock wall. 35 40

**SPECIAL WARNING.**—It shall be unlawful for any person to obstruct or interfere with any aid to navigation established or maintained by the coast guard under the Commandant of the Coast Guard, or to anchor any vessel in any of the navigable waters of the United States so as to obstruct or interfere with range lights maintained therein. This shall also apply, with equal force 45 and effect, to any private aid to navigation lawfully maintained under the authority granted the Secretary of the Treasury and the Commandant of the Coast Guard.

## LAKE ONTARIO

## DIMENSIONS, ELEVATIONS, ETC.

<b>Length</b>	West end of Burlington Bay to Sacketts Harbour.....	193 miles
<b>Breadth</b>	About Longitude $77^{\circ} 35' W$ .....	53 miles
<b>Depth</b>	Maximum recorded (Bottom 528 feet Below M.S. Level)..... Latitude $43^{\circ} 29' N$ , Longitude $76^{\circ} 58' W$ .	774 feet
<b>Rainfall</b>	Average annual (1890—1954).....	33.73 inches
<b>Area</b>	Water Surface..... Local Drainage Basin..... Entire Drainage Area.....	U.S.      Canada      Total 3,560      3,980      7,540      square miles 18,710      15,920      34,630      square miles 176,050      122,040      298,090      square miles
<b>Elevations</b>	In feet above M.S. Level referred to U.S.L.S. datum of 1903 adjustment and B.M. "Steel Rivet" at Kingston, Ontario.....	Elev. 252.710
<b>Recorded</b>	At Oswego, (minus 0.12 foot), 1860—1894; at Kingston 1895—1956	
<b>High Water</b>	of 1838 by inference more than records..... Highest month since 1860 (Mean of June 1952).....	Elev. 248.98 Elev. 249.12
<b>Low Water</b>	Lowest month since 1860 (Mean of December 1934)..... Datum for Canadian harbour improvements..... Datum for Canadian Charts.....	Elev. 242.55 Elev. 244.00 Elev. 243.00
<b>Mean Level</b>	1860 to 1956 inclusive, (97 years)..... Below mean level of Lake Erie..... Above mean level of Montreal Harbour.....	Elev. 245.93 326.45 219.95
<b>Max. Range</b>	In yearly mean levels 1860 to 1956 inclusive..... (1952, 247.84 to 243.41, 1935) In monthly mean levels 1860 to 1956 inclusive..... (1952 June, 249.12 to 242.55, December 1934) In monthly mean levels of one calendar year..... (1867 June, 248.36 to 244.71, December)	4.43 6.57 3.65
<b>Min. Range</b>	In monthly mean levels of one calendar year..... (1920 February, 244.95 to 245.66, July)	0.71
<b>Elevations</b>	(40 yrs. 1860—1899)      (57 yrs. 1900—1956)      (97 yrs. 1860—1956)	
<b>Mean</b>	246.13	245.79
<b>Max. Year</b>	247.51 (1862)	247.84 (1952)
<b>Min. Year</b>	244.23 (1895)	243.41 (1935)
<b>Max. Month</b>	248.83 (May 1870)	249.12 (June 1952)
<b>Min. Month</b>	243.34 (Nov. 1895)	242.55 (Dec. 1934)
<b>Mean Level</b>	1860—1869      246.71 1860—1879      246.39 1860—1889      246.40 1860—1899      246.13 1860—1909      246.08 1860—1919      246.07 1860—1929      245.99 1860—1939      245.82 1860—1949      245.86 1860—1952      245.90	<b>Mean Level</b> 1860—1869      246.71 1870—1879      246.08 1880—1889      246.40 1890—1899      245.32 1900—1909      245.90 1910—1919      245.99 1920—1929      245.50 1930—1939      244.69 1940—1949      246.13 1950—1956      246.89

INDEX TO CHARTS  
REFERRED TO IN  
GREAT LAKES PILOT  
VOLUME I  
1957 EDITION



**Water Surface Elevations of Lake Ontario (Covering Period of Navigation April to November inclusive) in Feet Above Mean Sea Level, for the Years 1860 to 1956.**

Year	Height in Feet	Highest		Lowest		Year	Height in Feet	Highest		Lowest	
		Mon.	Height	Mon.	Height			Mon.	Height	Mon.	Height
1860	246.98	July	247.70	Oct.	246.55	1910	245.89	June	246.40	Nov.	245.10
1861	247.83	June	248.42	April	247.11	1911	245.08	June	245.56	Nov.	244.47
1862	247.88	May	248.76	Nov.	246.61	1912	246.49	June	247.27	April	245.95
1863	247.27	June	248.06	Nov.	246.44	1913	247.16	June	247.95	Nov.	246.04
1864	247.11	June	248.00	Nov.	246.43	1914	246.17	May	246.77	Nov.	245.17
1865	246.80	June	247.54	Nov.	245.70	1915	245.10	Sept.	245.35	Nov.	244.89
1866	246.25	July	246.72	June	245.80	1916	246.72	July	247.83	Nov.	245.60
1867	247.22	June	248.36	Nov.	245.47	1917	246.77	July	247.36	April	246.16
1868	245.78	June	246.42	Nov.	245.08	1918	246.51	April	247.05	Oct.	245.92
1869	246.80	Aug.	247.23	April	245.97	1919	247.02	June	247.92	Nov.	246.03
1870	247.73	May	248.83	Nov.	246.26	1920	245.43	July	245.66	Nov.	244.97
1871	246.28	May	247.00	Nov.	245.09	1921	245.83	May	246.61	Nov.	244.67
1872	244.88	July	245.23	Nov.	244.57	1922	246.10	July	246.86	Nov.	245.00
1873	246.28	May	246.84	Nov.	245.50	1923	245.14	June	245.81	Nov.	244.24
1874	246.57	June	247.16	Nov.	245.28	1924	245.64	June	246.16	Nov.	244.84
1875	245.45	July	245.81	Nov.	244.98	1925	244.87	May	245.51	Oct.	244.16
1876	247.51	July	248.24	Nov.	246.49	1926	245.01	May	245.26	Sept.	244.77
1877	245.94	May	246.42	Nov.	245.13	1927	245.52	June	246.03	Nov.	244.75
1878	246.57	May	246.86	Nov.	246.09	1928	246.22	July	246.63	Nov.	245.54
1879	246.10	May	246.69	Nov.	244.98	1929	247.55	June	248.32	Nov.	246.55
1880	245.88	June	246.41	Nov.	245.18	1930	247.19	June	248.00	Nov.	245.53
1881	245.64	July	246.18	Oct.	245.07	1931	244.67	June	245.28	Nov.	243.89
1882	246.77	June	247.43	Nov.	245.75	1932	245.28	May	245.98	Nov.	244.28
1883	247.04	July	247.91	April	246.03	1933	244.49	June	245.23	Nov.	243.36
1884	247.43	May	248.07	Nov.	246.18	1934	243.54	May	244.31	Nov.	242.57
1885	247.02	July	247.46	April	246.15	1935	243.64	July	244.18	Nov.	242.98
1886	247.59	May	248.53	Nov.	246.39	1936	244.37	May	245.12	Nov.	243.63
1887	247.18	May	248.08	Nov.	245.90	1937	245.35	June	245.91	Nov.	244.73
1888	245.89	July	246.22	Nov.	245.29	1938	245.37	May	245.83	Nov.	244.60
1889	246.05	July	246.70	Nov.	245.06	1939	245.34	May	246.01	Nov.	244.21
1890	247.19	June	248.04	Oct.	246.52	1940	245.19	July	245.82	Nov.	244.58
1891	246.05	April	247.35	Nov.	244.32	1941	244.72	April	245.44	Nov.	243.98
1892	245.61	July	246.21	April	245.08	1942	245.51	June	245.99	Nov.	245.08
1893	246.33	June	247.25	Nov.	245.25	1943	247.67	June	248.62	Nov.	246.84
1894	245.82	June	246.68	Nov.	244.83	1944	246.40	July	247.08	Nov.	245.25
1895	244.25	May	244.99	Nov.	243.34	1945	247.36	June	247.75	April	246.78
1896	244.75	May	245.29	Nov.	244.00	1946	246.61	April	247.75	Nov.	245.85
1897	245.00	June	245.52	Nov.	244.17	1947	247.81	July	248.81	Nov.	246.73
1898	245.34	June	245.88	Nov.	244.62	1948	247.29	June	248.17	Nov.	246.02
1899	245.20	June	245.90	Nov.	244.23	1949	245.85	May	246.82	Nov.	244.58
1900	245.25	May	245.78	Nov.	244.38	1950	246.58	May	247.17	Nov.	245.79
1901	245.16	June	245.83	Nov.	244.08	1951	247.84	May	248.68	Nov.	246.63
1902	245.53	July	246.01	Nov.	245.01	1952	248.15	June	249.12	Nov.	246.59
1903	246.08	May	246.50	Nov.	245.19	1953	246.89	June	247.73	Nov.	245.61
1904	247.17	July	247.79	Nov.	246.25	1954	246.90	May	247.68	Oct.	246.31
1905	246.40	July	246.87	April	245.84						
1906	246.04	July	246.51	Nov.	245.53	1955	247.28	May	248.21	Oct.	246.44
1907	246.61	July	247.01	Nov.	246.11	1956	246.71	June	247.59	Nov.	245.58
1908	247.52	June	248.46	Nov.	245.77						
1909	246.33	June	247.13	Nov.	245.18						

Elevations are referred to U.S. Survey datum of 1903 adjustment. Water levels are at their lowest during the early winter months. Standard Low Water, or chart datum, is elevation 243.00 feet. The lowest monthly mean recorded was 242.57 feet for November 1934.

## GENERAL NOTES

**ICE.—Season of navigation.**—It is little obstructed by ice, seldom freezing, except near land. In the northeast corner, inside of the outlying islands, it has at times been reported to have frozen over for about ten miles above Kingston. Car ferries maintain daily passages across the lake, in the coal-carrying trade, and with accommodation for automobiles and passengers. The standard season of navigation, generally speaking, is from April 15 to December 15.

In general, Lake Ontario is free from outlying shoals and dangers; the only shoals dangerous to navigation being those found in the vicinity of Prince Edward county, off the Canadian shore, and amongst the islands in the northeastern part of the lake, and those shoals off the mouth of the Niagara River, known as Niagara Bar. These last named shoals are in the course of vessels entering and leaving the Niagara River, and near the tracks of vessels plying 15 between the Welland Ship Canal entrance at Port Weller, and the lake ports to the east and the St. Lawrence River.

**Harbours and commerce.**—Lake Ontario, the most easterly link in the chain of Great Lakes, receives the waters of Lake Erie through the Niagara River, and discharges its supply through the St. Lawrence River into the Gulf 20 of St. Lawrence. The completion of the Welland Ship Canal, from Port Colborne to Port Weller, and improvement in the upper St. Lawrence Ship Channel, to Prescott, permits the larger vessels of the upper lakes to extend their former limit of navigation some 245 miles towards tidal waters.

The commerce and size of vessels in Lake Ontario has in the past been 25 limited, in comparison with that plying the other Great Lakes, by the restrictions of the old Welland Canal. The new Ship Canal, opened in 1931, now permits of navigation between Lake Ontario and the upper Great Lakes by vessels to a length of 715 feet (218<sup>m</sup>0) and draught of 23½ feet (7<sup>m</sup>1). The traffic to Lake Ontario ports, from Montreal and the lower St. Lawrence River ports 30 is limited to "canal size" vessels—determined by the dimensions of the locks of the St. Lawrence canals—viz., length 255 feet (77<sup>m</sup>7), beam 42 feet (12<sup>m</sup>8), draught 14 feet (4<sup>m</sup>3). (See "St. Lawrence River Pilot, Quebec to Kingston".)

Most of the commercial harbours are artificially-enlarged basins at the mouths of small rivers, having been improved by the building of jetties, training piers and breakwaters, and dredging. At many of them, periodical shoaling 35 takes place, and frequent dredging is required to maintain the channels.

**Variation of the compass.**—Over Lake Ontario, the variation of the compass does not change uniformly in going east or west, and there are many spots of wide departure from the normal variation,—that is,—the general value for 40 the surrounding region. Off the United States shore, about 10 miles northwestward from Olcott, in a distance of 4 miles, the variation ranges from 0° to 16° West, whereas the normal for the region is 7° West. Mariners following steamer tracks to and from the Welland Ship Canal and Niagara River are cautioned to observe this irregularity of magnetic declination.

45 At Port Hope, a small area close offshore was found to have a variation of 11° West, the normal for the vicinity being from 7° to 8° West. In the middle of the lake, about 20 miles southward from Port Hope, a small locality evidenced a variation of 13° West, with 8° West all around it. Close to shore along the lake side of Prince Edward county, from west of Point Petre to Prince 50 Edward Point, minor irregularities were found running from 6° West to 14° West.

The greatest variation from the normal regional declination has been found in the very neighbourhood of Kingston Harbour. In the northerly or Kingston entrance to the St. Lawrence River, when on the sailing line or prescribed track

from a point east of Portsmouth range to the Kingston waterfront, the values range from  $0^{\circ}$  to  $22^{\circ}$  West, while at a point on the steamer track, 6 miles to the southwestward, it is only  $7^{\circ}$  West, and at a point 6 miles down the St. Lawrence River it is  $11^{\circ}$  West.

About 2 miles to the northward of East Charity Shoal light-buoy, at a point 3 miles from Pigeon Island light and on a line thence to Tibbetts Point light, a variation of but  $1^{\circ}$  West occurs.

At the southerly entrance of the St. Lawrence River, at a point  $1\frac{1}{2}$  miles west of Tibbetts Point light, the variation is  $17^{\circ}$  W., while at a point on the river course 6 miles to the south-southwest it is only  $7^{\circ}$  W., and at a point 6 miles down the St. Lawrence River it is  $11^{\circ}$  W.

**Lake levels.**—The surface elevation of Lake Ontario is never constant, being subject to change from mechanical and natural agencies.

**Mechanical.**—These are the lowering of the general plane due to improvements, which enlarge the natural outlet, to loss of supply by diversions into adjacent watersheds from feeder lakes at higher levels; the raising of the general plane due to structures which restrict the natural outlet, and to increase in supply by diversions from adjacent watersheds, into feeder lakes at higher levels.

**Natural.**—The general fluctuations of the lake level may be considered under the headings, annual, monthly, or seasonal, daily and irregular.

**Annual.**—From year to year, the means surface elevation varies in relation to the balance between supply and discharge, natural or otherwise. The supply is the precipitation (less evaporation) over the local drainage area, plus the volume of water from Lake Erie through the Niagara River and the Welland Canals. The discharge is the outflow into the St. Lawrence River.

**Monthly or Seasonal.**—From month to month, the lake elevation is constantly changing in relation to the seasonal balance between the supply and discharge, attaining a maximum during the early summer and a minimum during the early winter.

**Daily.**—From day to day, the lake level changes, first regularly in relation to the monthly range, and secondly irregularly due to physical forces contributed to by winds, barometric pressures, and lunar influences.

**Irregular.**—The lake surface is never at rest, even during the calmest weather, and self-registering graphic gauges from which wave action is eliminated, record continuous irregular oscillations referred to as "Seiches". The barometric pressure may be constant in the vicinity of a recording station, while an area or areas of higher pressure may be passing or prevailing over distant sections of the lake, and these set up oscillations in the whole lake surface. The range and time intervals of seiches vary, being governed by the configuration of the shoreline and offshore depths. Thus, in the apex of a bay with a wide mouth, the seiche range will be greater than at the entrance; the reverse is observed in large bays with restricted entrances, the range being greatest at the narrow section. Generally speaking, a pronounced increase over the normal seiche range precedes a storm approaching from offshore. At times, the wind contributes a second irregular action by forcing the surface water to pile on to the lee shore faster than the under currents can return the impelled volume to windward. The range of pile-up also varies in relation to the shoreline configuration and offshore depths. Secondary undulations occur during the piling-up, relative to the sustained force or velocity of the wind. It is usually noted that a pile-up, due to wind, attains a maximum elevation and starts to recede at a considerable interval of time before the peak or maximum velocity of the

wind has reached the point of observation. The lunar influence is a tide of very small range and of no practical value, but, theoretically, it is a very interesting phenomenon.

The irregular oscillations of the water surface of Lake Ontario are not so 5 pronounced in range as those in the other Great Lakes, due to the smaller area with relatively deep water, the general symmetrical shape, and the fact that high and low centres of barometric areas do not as a rule pass directly over this body of water.

**Precise water level records.**—Self-registering gauges are maintained all 10 year at Kingston, Toronto, Cobourg and Port Weller, from which continuous surface elevations of Lake Ontario are available. The latest water level data, with a statistical analysis, are given in the monthly and annual bulletins issued by the Canadian Hydrographic Service.

## CHAPTER I

### LAKE ONTARIO

#### KINGSTON AND TIBBETTS POINT TO THE PASSAGE BETWEEN THE DUCKS AND GALLOO ISLAND AND THE PASSAGE BETWEEN MAIN DUCK AND FALSE DUCKS ISLANDS.

5

**Head of St. Lawrence River.**—The boundary between Lake Ontario and the St. Lawrence River is a line from Everett Point, Frontenac County, to Ninemile Point, Simcoe Island, and thence to the southwest point of Horseshoe Island; a line from the north point of Horseshoe Island to Staley Point, Wolfe Island; and, a line from Bear Point, Wolfe Island, to Tibbetts Point, New York 10 State. (Decision of the Geographic Board of Canada, 1924.)

Chart 1477.

**Cape Vincent Harbour, N.Y.** (*Lat. 44° 08' N. Long. 76° 20' W.*) is situated on the St. Lawrence River about  $2\frac{1}{2}$  miles below Lake Ontario, and has a wharf frontage of about  $1\frac{1}{2}$  miles. There is deep water to within a short 15 distance of the wharves, but the latter will not accommodate vessels drawing more than 9 to 11 feet ( $2^m7$  to  $3^m4$ ) of water.

**Breakwater.**—The breakwater is 500 feet ( $152^m4$ ) from and parallel to the New York Central Railroad wharf. The length of the main breakwater is 1,331 feet ( $405^m7$ ) and of the shore return 50 feet ( $15^m2$ ), a total of 1,381 feet 20 ( $420^m9$ ). The breakwater has mooring posts and vessels can lie on either side of it. It affords a convenient mooring place for downbound vessels reaching the river at night or in thick weather, at which times navigation of the upper river is dangerous, and also for upbound vessels arriving at the head of the river when weather conditions make it unsafe to proceed into the open lake. Soundings, taken in 1952, showed a least depth of 18 feet ( $5^m5$ ) in the approach to and around the breakwater, with width of 100 feet ( $30^m5$ ) at the upper end, widening to 250 feet ( $76^m2$ ) at the lower end of the mainland side, and depths of 24.6 to 26 feet ( $7^m5$  to  $7^m9$ ) along the river side of the breakwater. 25

**Lights.**—A light is exhibited, at an elevation of 28 feet ( $8^m5$ ), from a 30 white, square tower on the eastern and western ends of the breakwater.

**Submarine cables.**—A submarine cable extends from the Coast Guard lighthouse depot northeasterly to the western end of the breakwater. Two submarine cables extend from the mainland to Alexandria Point on Wolfe Island. One extends from Cape Vincent, and the other about 6 cables westward of the 35 western end of the breakwater.

**Harbour regulations.**—(1) The term "harbour", when used in these regulations, applies to all that portion of the St. Lawrence River lying within the following boundaries:

Beginning at a point on the harbour face of the breakwater at its easterly 40 end and extending in a straight line along the harbour face of the main part of the breakwater and in extension thereof westerly approximately 2,400 feet ( $731^m5$ ), thence at right angles to the above-described line southerly to the northeast corner of the "L" dock at the foot of Market Street, approximately

## Chart 1477.

300 feet (91<sup>m</sup>4); thence easterly along the dock face and shoreline to a point in a line at right angles to the breakwater at its easterly end; and thence along this last-described right angle line to the point of beginning.

5 (3) Vessels shall not exceed a speed of 8 miles per hour in the harbour.

(4) Vessels shall observe the following rules in mooring to the breakwater:

The first self-propelled vessel stopping at the harbour for shelter will proceed to the upstream end of the breakwater and moor along either side of it. All similar vessels entering later will place themselves in a compact position close 10 to those preceding them. Passenger vessels will, in general, have preference as to location of moorage. Sailing craft will so locate themselves that they will not lie in the way of other vessels entering the harbour. All vessels of every description will place themselves so as not to interfere with any work of reconstruction or repair that may be in progress at the time.

15 (5) The use of chains in making fast to the breakwater is prohibited. Lines must be attached to the snubbing posts only, and outboard anchors taken in.

(6) Vessels with other craft in tow will, if practicable, at once moor them compactly along the breakwater, either taking in the tow lines or placing the slack in them upon the breakwater in such a manner as not to interfere with 20 other vessels. If necessary to moor alongside other vessels moored to the breakwater, the tow lines shall be taken in or disposed of in such a manner as not to interfere with the departure of vessels moored between them and the breakwater.

(7) Vessels of every description, mooring to the breakwater, must place 25 suitable fenders between themselves and the breakwater to protect the timber walings on the breakwater from damage.

(8) The unloading of freight of any class upon the breakwater is expressly prohibited, except in accordance with special permission.

(9) Each and every vessel made fast to the breakwater, or anchored in 30 the harbour without a line made fast to the shore or shore dock, must have at least one experienced person upon it during the entire time said vessel is thus moored in the harbour.

**Tibbetts Point** (*Lat. 44° 06' N. Long. 76° 22' W.*) on the shore of Lake Ontario, is situated 2 $\frac{1}{3}$  miles southwest from Cape Vincent Harbour, the park-like coast between, 60 feet (18<sup>m</sup>3) high, being nearly straight, and steep-to. The point is composed of dark brown rock and its tall lighthouse, when the sun is on it, is conspicuous from the lake. Reefs extend off about 1,000 feet (304<sup>m</sup>8) around the point.

Tibbetts Point and Bear Point of Wolfe Island (page 10) may be considered 40 as the southeast and northwest entrance points of **South**, or **Main Channel** of the St. Lawrence River.

**Light.—Fog Signal.—Radiobeacon.**—A light is exhibited, at an elevation of 69 feet (21<sup>m</sup>0), from a white tower on the western extremity of Tibbetts Point.

45 A fog diaphone is sounded at the light station.

There is a radiobeacon, which is synchronized with the fog signal for distance-finding purposes, at the station.

*Charts 1459, 1477, 2064.*

**Shoal.**—A bank, with 17 feet (5<sup>m</sup>2) on it, lies with its north end bearing 50 243°, 0.85 mile from Tibbetts Point light. (For coast south of Tibbetts Point, see page 11.)

Charts 1459, 1477, 2064.

**Light-buoy.**—A black light-buoy, showing a *flashing white* light, is moored close westward of the above shoal.

**Kingston**, at the division of the St. Lawrence River from Lake Ontario and standing upon the west entrance point of **Cataraqui River** at a height of 60 feet (18<sup>m</sup>3), had, in 1956, a population of 45,625. Its distance, by the natural waters and canals, from the lower entrance of Lachine Canal, Montreal, is about 182 (158 nautical) miles. From abreast Quebec custom-house, it is distant nearly 344 (299 nautical) miles. By a branch of the Canadian National Railways 2 $\frac{1}{4}$  miles in length, Kingston has connection with the main line. It is also the terminus of the Bay of Quinte branch of the Canadian National Railways and Kingston and Pembroke branch of the Canadian Pacific Railway. Its distance by rail from Montreal is 175 $\frac{1}{2}$  miles, and from Toronto 163 $\frac{1}{2}$  miles. The city is the seat of Queen's University. The Royal Military College is situated on Point Frederick. The most conspicuous objects in Kingston are the dome of the city hall, with its illuminated clock, which serves as a lighthouse, the tall square tower of the St. Mary's Roman Catholic cathedral, the dome of St. George's Anglican cathedral, and several other church spires, Rockwood Asylum, a grain elevator, and several martello towers. A depth of 16 $\frac{1}{2}$  feet (5<sup>m</sup>0) can be carried into Kingston Harbour, on the line of the leading lights. 10 15 20

A bridge, called **La Salle Causeway**, crosses Kingston Harbour, half a mile north of Point Frederick, and, through which, by means of a lift 150 feet (45<sup>m</sup>7) wide, vessels drawing 15 $\frac{1}{2}$  feet (4<sup>m</sup>7) can proceed to the Canadian Pacific Railway wharf, or proceed to Ottawa and Perth by the Rideau Canal system if drawing not more than 5 feet (1<sup>m</sup>5). 25

**Inner harbour.**—The area lying just north of La Salle Causeway, extending across the river and from 200 to 600 feet (61<sup>m</sup>0 to 182<sup>m</sup>9) wide, has been dredged to from 9 to 18 feet (2<sup>m</sup>7 to 5<sup>m</sup>5).

Vessels dock on the north side of the causeway where, sheltered by that structure, there is good wharfage for 600 feet (182<sup>m</sup>9). 30

**Anglin Bay.**—A channel, 100 feet (30<sup>m</sup>5) in width at the narrowest part, leading from the inner harbour to the Canadian Pacific Railway dock in Anglin Bay, has been dredged to 18 feet (5<sup>m</sup>5), with the same depth at the end of this dock. There is a depth of 14 $\frac{1}{2}$  feet (4<sup>m</sup>5) along the face of Soward's coal dock.

The slip, on the west side of the bay, has been dredged to 12 feet (3<sup>m</sup>7), 35 and the channel to Davis dry dock to 10 feet (3<sup>m</sup>0).

**Buoy.**—A red spar buoy marks the northern side of this dredged area.

**Dredged Channel.**—**Buoyage.**—The dredged channel, from the southwest extremity of Carruthers Shoal to La Salle Causeway, is marked by six red spar buoys and two black spar buoys, the positions of which can best be seen on the chart. 40

**Period of navigation.**—The average date of the opening of navigation is April 8; that of the closing December 18. (See also page 31).

**Radio station.**—A radio station, open during the season of navigation, is established at Kingston, on the heights above Fort Henry (*Lat. 44° 14' N. Long. 76° 28' W.*). The call signal is VBH. Reports respecting dangers to navigation on Lake Ontario and the St. Lawrence River, above Montreal, and weather reports are transmitted. 45

**Ferry.**—A ferry plies daily to Wolfe Island.

Charts 1459, 1477, 2064.

**Dry Docks.**—The Government dry dock is situated 600 yards (548<sup>m</sup>6) south of the city hall. Its length is 353½ feet (107<sup>m</sup>8), which may be increased by 23½ feet (7<sup>m</sup>2) if floating caisson is placed in outer stop, the breadth of entrance 5 55 feet (16<sup>m</sup>8), and the depth on sill, 13¾ feet (4<sup>m</sup>2), at the extreme low water of 1895.

A private dry dock, suitable only for small vessels, is situated above the bridge, and known as Davis dry dock. It is 213 feet (64<sup>m</sup>9) long, 43 feet (13<sup>m</sup>1) wide, with a depth of 9 feet (2<sup>m</sup>7) on the sill.

**Rideau Canal.**—The Ottawa and St. Lawrence Rivers are connected, at 10 Kingston, by the Rideau Canal 123½ miles in length. (For a description of locks, depths, and other details, see "St. Lawrence River Pilot, Quebec Harbour to Kingston Harbour." See also pages 21 to 31.)

**Leading lights.**—Leading lights are shown from Barriefield Common at 15 the eastern end of the causeway. The front light is exhibited, at an elevation of 48 feet (14<sup>m</sup>6), from a red tripod, surmounted by a white, oval daymark, close eastward of La Salle Causeway; the rear light is exhibited, at an elevation of 75 feet (22<sup>m</sup>9) from a similar structure, about 2½ cables, 037° from the front light. The lights in line lead into the harbour.

20 The illuminated dome of the City Hall is visible for about 9 miles to seaward.

**Wharves.—Depths.**—The Government wharf at Portsmouth, with 15 feet (4<sup>m</sup>6) of water at the outer end, extends 685 feet (208<sup>m</sup>8) from the west side of the shallow bay immediately west of the penitentiary ground. On the eastern 25 side of this bay is a wharf 315 feet (96<sup>m</sup>0) in length, with a depth of 16 feet (4<sup>m</sup>9) alongside. From the landing of the penitentiary just west of Kingston, the wharves are almost continuous for 2 miles to the bridge, having depths ranging from 12 to 20 feet (3<sup>m</sup>7 to 6<sup>m</sup>1) and a total frontage of 4,000 feet (1,219<sup>m</sup>2). Half a mile below the penitentiary is the Public Utilities dock with 30 14 feet (4<sup>m</sup>3) of water alongside. Queen's University dock lies just above

#### MacDonald Park.

The Canadian Shipbuilding and Engineering Company dock with 20 feet (6<sup>m</sup>1) of water along the outer end is located two-thirds of a mile southwest of 35 La Salle Causeway. The Canadian Locomotive Company dock, north of the last-mentioned, has 19 feet (5<sup>m</sup>8) of water along the outer face, and the berth 80 feet (24<sup>m</sup>4) wide along the outer end of the north side has been dredged to 9½ feet (2<sup>m</sup>8).

Next in order is Swifts dock with 13 feet (4<sup>m</sup>0) of water at the outer end, 40 12½ feet (3<sup>m</sup>9) on the north side and 10 feet (3<sup>m</sup>0) on the south side. The berth on the south side of the Rockport Navigation Company wharf, 100 feet (30<sup>m</sup>5) long and 50 feet (15<sup>m</sup>2) wide, has a depth of 11 feet (3<sup>m</sup>4). The berth on the north side has a depth of 13 feet (4<sup>m</sup>0). Richardson elevator dock has a depth of 16 feet (4<sup>m</sup>9) on the south side and 17 feet (5<sup>m</sup>2) on the north side. The 45 R. C. Crawford dock has a depth of 18 feet (5<sup>m</sup>5) at the outer end. The wharf of Canada Steamships Lines Ltd. is located 800 feet (243<sup>m</sup>8) below the causeway; it has a depth of 18 feet (5<sup>m</sup>5) alongside, excepting the inner 40 feet (12<sup>m</sup>2) of the southern slip, which has been dredged to 11½ feet (3<sup>m</sup>6). On the north side of La Salle Causeway, at the east end, is a Government wharf with a 50 frontage of 454 feet (138<sup>m</sup>4). Along the face is a depth of 9 to 11 feet (2<sup>m</sup>7 to 3<sup>m</sup>4) with 10 feet (3<sup>m</sup>0) in the approach.

**Carruthers and Point Frederick Shoals.**—A bank, half a mile long northeast and southwest, extends from abreast the Government dry dock towards the shore a little north of Point Frederick, and a rocky ridge, under

## Charts 1459, 1477, 2064.

6 feet (1<sup>m</sup>8), extends 400 feet (121<sup>m</sup>9) from Point Frederick. The southwestern and shoaler portion, with 8 feet (2<sup>m</sup>4) of water on it is named Carruthers, and the northeastern part, with 11 feet (3<sup>m</sup>4) is known as Point Frederick Shoal. Between Carruthers Shoal and Point Frederick, there is a passage with depth of 10 feet (3<sup>m</sup>0), known as the **Eastern Channel**, but the more direct and deeper channel, with 16½ feet (5<sup>m</sup>0) of water, is between the bank and the city, the line of Barriefield Common leading lights leading just clear of the bank extending from the city.

**Buoys.**—A red spar buoy marks the southwest extreme of Point Frederick 10 Shoal; the southeast side of Carruthers Shoal is marked by a black spar buoy and the southwest extreme by a red spar buoy. Four red spar buoys mark the eastern side of the dredged channel and turning basin; three black spars mark the opposite side.

**Intake pipes.**—Two buoys mark the location of the city's intake pipe. 15 The outer buoy, a red spar, lies in the line of the east side of West Street, 2,550 feet (777<sup>m</sup>2) south-southeastward from the waterworks wharf; the inner buoy, red conical, showing a *flashing red* light, lies about a quarter of a mile from the same wharf.

A red light-buoy, showing a *flashing red* light, marks the outer end of a 20 second intake pipe, which extends 1,000 feet (304<sup>m</sup>8), 172°, from the southwest corner of the Public Utilities wharf.

**Magnetic disturbance.**—The normal variation of the compass (1940), for the shores adjacent to Kingston Harbour, is about 12 degrees *west*, but, along the front of the city, it is not less than 18 degrees in the same direction. At 25 the Government dry dock, it is as much as 30 degrees *west*, and abreast the Penitentiary it is 18 degrees *east*. A short distance west of Rockwood Asylum, the variation is again normal. Midway between Point Frederick and Garden Island, the amount of *westerly* variation is 20 degrees. At Simcoe Island, it is normal.

The effect to the mariner is, that the bearings, if magnetic, of the line of the Kingston leading lights, and those of the buoys in the vicinity, may differ from those actually observed by him. Moreover, extra caution is necessary in approaching or leaving Kingston in thick weather on a course. (See page xxvi).

**Cataraqui Bay.**—From Kingston, the shore, rising to a height of about 35 60 feet (18<sup>m</sup>3) trends westerly 2½ miles to Samson Point on the east side of Cataraqui Bay, which runs in three-quarters of a mile, with depths under 9 feet (2<sup>m</sup>7).

**Elevators.**—The elevator of the Kingston Elevator Company Limited is located in Cataraqui Bay. It is a long, narrow structure having a capacity of 40 2,500,000 bushels, with unloading facilities on one side and loading-out facilities on the other side. The slip for unloading the upper lake boats is on the downstream side of the elevator and is 700 feet (213<sup>m</sup>4) long, 300 feet (91<sup>m</sup>4) wide, and dredged to 23½ feet (7<sup>m</sup>2). The slip for loading the canal-size boats is 600 feet (182<sup>m</sup>9) long, 250 feet (76<sup>m</sup>2) wide, and dredged to 17 feet (5<sup>m</sup>2). 45 Unloading facilities consist of two travelling marine towers, by means of which all the holds may be reached without moving the ship. Shipments may also be made by rail as the Canadian National Railways have built a spur line to the elevator.

**Breakwater.**—For the protection of the berths at the elevators, a breakwater 50 2,560 feet (780<sup>m</sup>3) long has been built from Carruthers Point. The outer end is 2,610 feet (795<sup>m</sup>5), 073° from the front light of Portsmouth leading lights.

Charts 1459, 1477, 2064.

**Light-buoy.**—A black, cylindrical light-buoy, showing a *flashing green* light, is moored off the east end of the rubble-mound breakwater at the west side of the entrance to the elevator slips at Cataraqui Bay.

5      **Dredged basin.—Buoys.**—A turning basin, off the south end and west side of the pier of the Kingston Elevator Company, is dredged to a depth of 17 feet (5<sup>m</sup>2); the west side of the dredged area is marked by three black spar buoys.

10     **Leading lights.**—Leading lights are shown at Cataraqui Bay. They lead in to the north channel approaching Kingston and the head of the St. Lawrence River. The front light is exhibited, at an elevation of 32 feet (9<sup>m</sup>8), from a white, square structure on **Carruthers Point**, the western entrance point of Cataraqui Bay; the rear light is exhibited, at an elevation of 101 feet (30<sup>m</sup>8), from a white, square, skeleton tower on the north shore of the bay, about 6<sup>1</sup>/<sub>2</sub> cables, 018<sup>1</sup>/<sub>2</sub>° from the front light. A secondary light at the front light is visible from all points of approach from the eastward.

20     Vessels approaching from the westward in the lake may head for Ninemile Point light until the leading lights are in line; the leading lights lead between Melville Shoal and Middle Ground into the North Channel, with nowhere less than 24 feet (7<sup>m</sup>3). When Snake Island is abeam, the leading line may be left and a course shaped to lead north of Penitentiary Shoal. (See below).

25     **Intake pipes.**—Two intake pipes extend 1,960 feet (597<sup>m</sup>3) southward from the south extreme of Carruthers Point (*Lat. 44° 12' N. Long. 76° 33' W.*) A large sign marks the shore end of the pipes and mariners are warned not to anchor in its vicinity. A red light-buoy, showing a *flashing red* light, marks the extremities of the pipes.

**Myles Shoal**, with 8 feet (2<sup>m</sup>4) on it, is an isolated patch, lying nearly in the middle of the channel, and a mile northwestward from Garden Island.

30     **Buoy.**—A spar buoy, painted with red and black horizontal bands, is moored on Myles Shoal, and bears 221°, distant 1<sup>1</sup>/<sub>4</sub> miles from Point Frederick.

**Penitentiary Shoal**, with 10 feet (3<sup>m</sup>0) of water on it, lies a mile, 105°, from Samson Point, and 1.1 miles westward of Myles Shoal.

35     **Light-buoy.**—A cylindrical light-buoy, 61T, painted with red and black horizontal bands and exhibiting a *flashing white* light, is moored on Penitentiary Shoal.

Chart 2064.

40     **Collins Bay** is situated at the northeast entrance to North Channel, the eastern entrance to Bay of Quinte, and 3<sup>3</sup>/<sub>4</sub> miles westward from Cataraqui Bay, the shore between being indented by several bays. One and a half miles westward of Carruthers Point (see above) is **Everett Point**, and lying 500 yards (457<sup>m</sup>0) off it is a 7-foot (2<sup>m</sup>1) patch. The entrance to Collins Bay is half a mile wide, and runs in, northeasterly, 2 miles. There is a small wharf on the west entrance point, with a depth of 11 feet (3<sup>m</sup>4) at the outer face. Collins Bay has a good depth throughout, and a sheltered anchorage in 4 fathoms (7<sup>m</sup>3) of water. At its head is the village of Collins Bay, 7<sup>1</sup>/<sub>2</sub> miles distant from Kingston, by the Canadian National Railways.

45     **Buoys.**—A red spar buoy marks the 7-foot (2<sup>m</sup>1) patch. The other end of the wharf in Collins Bay is marked by a red spar buoy.

## Chart 2064.

**Coast.**—From the entrance to Collins Bay, the shore trends westward for 3 miles to **Parrot Point**, northwest of which, **Parrot Bay** runs in for three-quarters of a mile. The bay, with the exception of a spot on the southeastern shore, with a depth of 15 feet ( $4^m6$ ) over it, is free from shoals, but it is open to the southwest. 5

**Light-buoy.**—A red light-buoy, showing a *flashing red* light, is moored close offshore about 3 cables eastward of Parrot Point.

**Wharf.**—The wharf of the Canadian Liquifuels Ltd. lies at the western entrance to Parrot Bay. It is about 650 feet ( $198^m1$ ) long. 10

**Light.**—A light is exhibited from the outer end of the above wharf.

**Intake pipe.—Buoys.**—The water intake pipes of the Canadian Industries Ltd. plant lie about 3 cables westward of the Liquifuels wharf. The position of the pipe is marked by two red spar buoys.

**Millhaven Creek** empties into North Channel about  $2\frac{1}{4}$  miles westward of Parrot Bay. **Millhaven**, at the mouth of the creek, has a small wharf, 128 feet ( $39^m0$ ) long, with a depth of 9 feet ( $2^m7$ ) at the outer end.

A ferry runs from the village to Stella, on Amherst Island.

**Bath**, with a population of 637 in 1956, is situated in a small bay about 2 miles westward of Millhaven. There are three small wharves in the village, 20 with a depth of about 10 feet ( $3^m0$ ) at each wharf.

From Bath, the main shore trends southwestward for 6 miles, to the village of **Sandhurst**, half a mile northeast of which is Downey wharf at the entrance to that part of Bay of Quinte known as Adolphus Reach. Between the latter and Collins Bay, a distance of  $13\frac{3}{4}$  miles, the mainland shore is fairly steep-to. 25

**Pleasant Point.**—The northeast extremity of Prince Edward County, formerly a peninsula, until made an island by the present Murray Canal, is named Pleasant Point, which together with Sandhurst, defines the northeast limit of Adolphus Reach. Pleasant Point is distant 2 miles from **Bluff Point**, the southwest extremity of Amherst Island, the channel between being known 30 as Upper Gap.

At Pleasant Point is a small basin, 50 feet ( $15^m2$ ) wide and 150 feet ( $45^m7$ ) long, that has been dredged to a depth of 5 feet ( $1^m5$ ) for the use of the fishing boats.

**Light.**—A light is exhibited, at an elevation of 54 feet ( $16^m5$ ), from a 35 steel tower on the eastern extremity of Pleasant Point.

**Amherst Island**, lying between Kingston and Prince Edward County, is 10 miles in length, northeast and southwest, its greatest breadth being  $4\frac{1}{2}$  miles. The water on its northwest side is termed the **North Channel of Bay of Quinte** with a least breadth of  $1\frac{1}{2}$  miles, and depths varying from 9 to 39 fathoms 40 ( $16^m5$  to  $71^m3$ ).

**Brother Islands**, small, and three in number, lie between the entrance to Collins Bay and the northeast point of Amherst Island, to which they are connected by a narrow ridge above water, known as **Amherst Bar**. The middle one of the Brothers is known as **Centre Brother**, separated from the western 45 islet by a narrow channel with depth of  $4\frac{1}{2}$  fathoms ( $8^m2$ ).

## Chart 2064.

**Light.**—A light is exhibited, at an elevation of 50 feet (15<sup>m</sup>2), from a white, square building surmounted by a red lantern on Centre Brother Island.

5 **Kerr Point**, on the northwest coast, and nearly midway between the northeast and southwest extremities of Amherst Island, projects half a mile in a northeast direction, with **Kerr Bay** on the southeast side, and **Kerr Point Shoal**, just awash, 200 yards (182<sup>m</sup>9) from its northwest side.

**Light-buoy.**—A black light-buoy, showing a *flashing white* light, is moored on the northern edge of Kerr Point Shoal.

10 Between Amherst Bar and Kerr Point, there are three other small bays, the middle one being known as **Stella Bay**. Here is the village of Stella, where there is a Government wharf, with a pierhead 88 feet (26<sup>m</sup>8) in length and a depth of 9 feet (2<sup>m</sup>7) alongside. The coast of the island for 1 $\frac{3}{4}$  miles northeast of Stella Bay is bold. Here, however, a bank extends off half a mile, and continues to Centre Brother lighthouse.

15 **Wright Bay** lies close west of Stella Point. Between Stella and the east end of Amherst Island are **Griffin Point** and **Preston Cove**.

20 **Emerald** is a village on the northern side of Amherst Island 3 miles southwest of Kerr Point, and 2 $\frac{1}{4}$  miles from the western extremity of the island. At its pier, there is a depth of about 9 feet (2<sup>m</sup>7). A danger, named **Berdans Shoal**, with a depth of about 4 feet (1<sup>m</sup>2), extends 400 yards (365<sup>m</sup>8) from the coast a little northeast of Emerald.

Close west of Emerald Village is **Barry Point**.

25 **Ferry.**—A ferry operates between Emerald and Bath and also between Stella Bay and Millhaven.

A **telegraph cable** crosses the North Channel from the mainland to Barry Point.

30 From Barry Point, the coast trends generally southwestward to **Pig Point**, the northwestern extremity of a headland known as **The Head**, which is the western extremity of Amherst Island. **Bluff Point**, the southeastern extremity of The Head, forms the northwest shore of **Wemps Bay**, a horseshoe-shaped bay extending inland for about one mile. Off the point forming the southern shore of Wemps Bay is **La Force Island**. No channel exists between La Force Island and Amherst Island.

35 **Light.**—A light is exhibited, at an elevation of 29 feet (8<sup>m</sup>8), from a steel tower on Pig Point.

40 **Salmon Island**, (*Lat. 44° 12' N. Long. 76° 35' W.*), quite small, lies with its north end bearing 107°, distant 2 miles from Centre Brother Island lighthouse. It occupies the northeast edge of a bank, that extends from it half a mile southeastward, while, to the northwest, it is joined to Amherst Bar. Vessels should not attempt to pass south, or west of Salmon Island.

**Buoys.**—A black spar buoy is moored about 6 cables northwestward of Salmon Island and a black light-buoy, showing a *flashing green* light, is moored about 400 feet (121<sup>m</sup>9) northeastward of the same island.

45 **Nut Island.**—From Amherst Bar, the southeast coast of Amherst Island trends, with a slight inward curve, with no landing places, southwesterly 7 miles to **Emeric Point**, the south extremity of the island. Here a Government wharf extends to a depth of 4 feet (1<sup>m</sup>2). Three-quarters of a mile west of this

## Chart 2064.

point is Nut Island, the two enclosing a shallow bay running in one mile. About the middle of the southeast coast of Amherst Island, a bank, with 12 feet (3<sup>m</sup>7) of water on it, lies off, three-quarters of a mile, the rest of the coast being fairly clean.

**Big Bar Shoal**, isolated, with a depth of 7 feet (2<sup>m</sup>1) over it, lies 205°, 3 miles from Emeric Point of Amherst Island, and 6½ miles, 120° from Pleasant Point lighthouse.

## Charts 1477, 2064.

**Simcoe Island**, a little over 3½ miles in length northeast and southwest 10 and a mile in greatest width, with scattered trees, and about 40 feet (12<sup>m</sup>2) high, is situated at the northwest extremity of Wolfe Island, being separated therefrom, by a passage a quarter of a mile wide, called **Bateau Channel**, suitable only for small craft, on account of the shoals stretching from the northeast end of Simcoe Island to Garden Island and Ferguson Point. Simcoe Island wharf 15 on the south side of the island, about half a mile from its southeastern point, has a face 60 feet (18<sup>m</sup>3) in length, with a depth of 5½ feet (1<sup>m</sup>7) alongside.

On the southern side of Simcoe Island, about one mile from its southeastern end, is a marshy indentation, off which lies a small island, one-half mile in length. An entrance channel leads past the westerly end of the island into a 20 small basin, in which is located the wharf of Belyea Bros. The channel and dock are dredged to a depth of 6 feet (1<sup>m</sup>8).

**Light.—Fog signal.**—A light (*Lat. 44° 09' N., Long. 76° 33' W.*) is exhibited, at an elevation of 45 feet (13<sup>m</sup>7), from a circular, stone tower at 25 **Ninemile Point** on the southwest extremity of Simcoe Island.

A fog diaphone is sounded at the light station.

From Ninemile Point, shoal water extends southwestward for a quarter of a mile. From the northwest side of Simcoe Island, a mile from the lighthouse, a flat extends a third of a mile, and, from the northern portion of the island, a bank extends half a mile, leaving a narrow channel, with depth of 13 feet (4<sup>m</sup>0) 30 between it and Snake Island Bank.

**Snake Island**, small, and with a few trees on it, lies upon the northwest edge of a bank two-thirds of a mile in diameter. The remains of the old pier, on which Snake Island light stood, are to be seen bearing 300°, distant 1,030 yards (914<sup>m</sup>8) from Fourmile Point. The island bears 308°, and is a mile 35 distant from Fourmile Point.

**Buoys.**—A black light-buoy, showing a *flashing white* light, is moored on the northwest extremity of Snake Island Bank, 7 cables south of Portsmouth front leading light. A red spar buoy is moored on the same bank, 300 feet (91<sup>m</sup>4) southeastward of the old lighthouse pier located half a mile northwestward of 40 Fourmile Point.

**Middle Ground**, with a depth of 12 feet (3<sup>m</sup>7) over it, lies between Snake Island Bank and Melville Shoal.

**Light-and-bell-buoy.**—On the west side of Middle Ground is moored a black, cylindrical buoy, 69 T, showing a *flashing white* light, bearing 358°, 45 distant a little more than 1½ miles from Ninemile Point light.

**Clearing mark.**—Pigeon Island light in line with Ninemile Point light, bearing 356°, leads close west of Middle Ground.

Charts 1477, 2064.

5 **Melville Shoal**, with one foot ( $0^m3$ ) of water over it, lies midway between Simcoe Island and the northeast extremity of Amherst Island. Under the depth of 18 feet ( $5^m5$ ), it extends  $1\frac{1}{2}$  miles northeast and southwest, its breadth being a third of a mile.

**Buoy.**—The southeastern edge of this shoal is marked by a red spar buoy, bearing  $339^\circ$ , distant  $1\frac{3}{4}$  miles from Ninemile Point light.

Portsmouth range lights in line, bearing  $018\frac{1}{2}^\circ$ , lead between Melville Shoal and the Middle Ground (see above).

10 **Wolfe Island**, 16 miles in length and 8 miles in breadth, entirely in Canadian territory, lies in the head of the St. Lawrence River, between the Canadian, or Kingston, and the American, or South, Channels.

15 The southwest side of Wolfe Island has four prominent projections. Off the northwestern point, known as **Staley Point**, distant 400 yards ( $365^m8$ ), lies **Horseshoe Island**, half a mile in diameter, 10 feet ( $3^m0$ ) high, and partly wooded, and at the southwest entrance to Bateau Channel. Shoal water extends half a mile from the southwest point of Horseshoe Island.

20 **Bell Point**, low, with scattered trees, lies one mile south of Horseshoe Island, the head of **Grimshaw Bay**, between them, being shallow. Shoal water extends a third of a mile from Bell Point.

25 **Long Point**, (*Lat.  $44^\circ 06' N.$  Long.  $76^\circ 30' W.$* ) its shape indicated by its name, projects southwestward  $1\frac{2}{3}$  miles from the same side of Wolfe Island, having between it and Bell Point, a large indentation named **Reed Bay**, running in nearly 3 miles, but shallow at the head as well as on its northwest and southeast sides. Long Point is low and sparsely wooded. A dangerous bank extends over three-quarters of a mile southwestward from Long Point. At half a mile from the point, the depth is but five feet ( $1^m5$ ). A red spar buoy is moored at the outer end of this bank.

30 **Bear Point** (see page 2), the southwest extreme of Wolfe Island and the southeastern of the four projections above mentioned, encloses, together with Long Point, the broad, and fairly clean bight known as **Big Sandy Bay**,  $1\frac{3}{4}$  miles wide, the eastern side of which is composed of sand-hills, 20 to 30 feet ( $6^m1$  to  $9^m1$ ) high.

35 **Buoy.**—A red spar buoy is moored off the southwest extreme of Bear Point.

**Pigeon Island**, a small island, lies about 4 miles southwestward of Long Point.

**Light.**—A light is exhibited, at an elevation of 65 feet ( $19^m8$ ), from a white, square, steel, skeleton tower, on the eastern side of Pigeon Island.

40 **Charity Shoal**, with one foot ( $0^m3$ ) of water over it, is one of three dangerous reefs lying  $3\frac{1}{2}$  miles southeastward of Pigeon Island. Charity Shoal is three-quarters of a mile long, northeast and southwest.

45 **Buoy.**—A black spar buoy is moored in 4 fathoms ( $7^m3$ ) on the northwest side of Charity Shoal, bearing  $125^\circ$  distant 3 miles from Pigeon Island light.

Charts 1477, 2064.

**South Charity Shoal**, a small patch with 11 feet ( $3^m4$ ) of water on it, lies half a mile southward of the southwest extremity of Charity Shoal, and bears  $134^\circ$ , distant  $3\frac{1}{2}$  miles from the same light.

**East Charity Shoal**, with 7 feet ( $2^m1$ ) of water on it, lies half a mile southeast of Charity Shoal. It is about a mile in length, and 230 yards ( $210^m3$ ) in width. 5

**Light.**—A light is exhibited, at an elevation of 52 feet ( $15^m8$ ), from a white, octagonal tower on East Charity Shoal.

**Bell-buoy.**—A red bell-buoy, No. 4, is moored close southward of the 10 light.

**Caution.**—Vessels bound to and from the south channel of the St. Lawrence River should keep well to the eastward and southward of East Charity Shoal light.

**Abnormal magnetic variation** exists near Charity Shoals. (See page xxvi). 15

**Allan Otty Shoal**, with 10 feet ( $3^m0$ ) of water over it, is a narrow reef, half a mile long east and west, 2 miles  $195^\circ$  from Bear Point of Wolfe Island, and a little southeast of the line joining the latter to the light on East Charity Shoal. It should be avoided in rough weather, even by light-draught vessels.

**Light-buoy.**—A red light-buoy, No. 2, showing a *flashing red* light is 20 moored in 30 feet ( $9^m1$ ) of water on the south side of the shoal.

*United States chart 21.*

**Grenadier Island**,  $3\frac{1}{2}$  miles southward of Tibbetts Point, (*Lat.  $44^\circ 06' N.$  Long.  $76^\circ 22' W.$* ), is  $2\frac{1}{3}$  miles long, northeast and southwest, by  $1\frac{1}{2}$  miles in breadth and thickly wooded. Shallow spits extend three-quarters of a mile from its southwest extremity, and nearly half a mile from its south side. In passing Grenadier Island, vessels should not shoal to less than 10 fathoms ( $18^m3$ ). 25

**Fox Island** lies two-thirds of a mile east of Grenadier Island. A depth of 8 feet ( $2^m4$ ) can be carried through the channel between these islands, and both islands are joined to the bight eastward of them, by shoals. The north point of 30 this bight is named **Baird Point**, and between it and Tibbetts Point distant 3 miles, there are three indentations, known as **Fuller**, **Wilson**, and **Mud Bays**. The latter and southern bay is shallow, narrow and runs in  $1\frac{1}{2}$  miles to **Mud Creek**.

The promontory north of Mud Bay is called **Dablon Point**, off which a 35 bank with 6 feet ( $1^m8$ ) least water extends three-quarters of a mile.

**Anchorage.**—Between Dablon Point and Grenadier Island, vessels will find good anchorage in 7 to 8 fathoms ( $12^m8$  to  $14^m6$ ) with protection from all but westerly winds.

**Point Peninsula**, 6 miles long and about 60 feet ( $18^m3$ ) high, is connected 40 at its northwest extremity to the mainland of New York State by a narrow short isthmus. The southwest extremity of Point Peninsula is distant  $6\frac{1}{4}$  miles southeast of Grenadier Island, and the shore of the bay formed between them has shoal water extending from it three-quarters of a mile.

A bank makes off half a mile from the southwest extremity of Point 45 Peninsula. Several wrecks have occurred on the reef, and it should be given a wide berth. The water is deep along the southeast coast of Point Peninsula.

## United States chart 21.

An isolated spot with 14 feet ( $4^m3$ ) of water on it lies three-quarters of a mile,  $225^\circ$ , from the southwest extremity of Point Peninsula.

**Light-buoy.**—A black light-buoy, showing a *flashing white* light, is moored about one mile southward of the southern extremity of Point Peninsula.

**Chaumont Bay.**—Between the middle of the southeast coast of Point Peninsula and Pillar Point (see below) is the entrance, three-quarters of a mile wide, of a large basin, the northern part of which is known as Chaumont Bay. The latter is well protected, and, has good anchorage in  $3\frac{1}{2}$  to  $4\frac{1}{2}$  fathoms (6 $m^4$  to 8 $m^2$ ) over mud bottom, in the middle and western portion. The shallow and narrow northern arm of this basin takes the name of **Three Mile Bay**, at the head of which is the village of the same name, and a pier, to which 3 feet (0 $m^9$ ) water can be carried.

**Point Salubrious**, 45 feet ( $13^m7$ ) high, divides Chaumont and **Giffin Bays**; **Giffin Creek** flows into the head of the latter, and shallow water extends from its mouth half a mile. With this exception, the bay has a depth of  $4\frac{1}{2}$  to 5 fathoms (8 $m^2$  to 9 $m^1$ ) over a mud bottom, and good shelter, but there is no landing pier.

**Chaumont Village** is situated at the northeastern extremity of Chaumont Bay, at the head of two small bights, both arms of Chaumont Bay, running in northward of Point Salubrious. There are landings in both bights which will accommodate vessels drawing 6 feet (1 $m^8$ ). Chaumont River flows into the northwesterly small bight near Chaumont Village, which possesses stone quarries, large quantities of stone being shipped by sea and by railway. The village is connected to Cape Vincent by a branch of the New York Central and Hudson River Railway.

Point Salubrious is steep-to, but from the north shore, between Chaumont Village and Three Mile Bay, shallow flats extend out to the middle of the bay.

**Johnson Shoal**, with a least depth of 2 feet (0 $m^6$ ), boulder bottom, lies on the northwesterly side of the approach to Chaumont and is marked on its easterly edge by a black can buoy moored  $1\frac{1}{8}$  miles,  $238^\circ$  from Independence Point light.

**Light.**—A light is exhibited, at an elevation of 30 feet (9 $m^1$ ), from a white, skeleton tower on **Independence Point**, at Chaumont Harbour.

**Cherry Island** is a mile long, northeast and southwest, but narrow, lies half a mile southwest of Point Salubrious, and, between them, is a good passage. The coast of the island is clean.

**Light.**—A light is exhibited, at an elevation of 32 feet (9 $m^8$ ), from a white, skeleton tower on the southwest point of Cherry Island.

**Pillar Point**, (*Lat.  $43^\circ 58' N.$  Long.  $76^\circ 12' W.$* ), 60 feet (18 $m^2$ ) high, is  $5\frac{1}{4}$  miles from the head of Giffin Bay, the shore between them being steep-to. A bank, with depths under 3 fathoms (5 $m^5$ ), extends from Pillar Point for a third of a mile.

**Bull Rock Point**, the north entrance point of Black River Bay, is  $1\frac{3}{4}$  miles southeast of Pillar Point, the bay between them being shallow. From Bull Rock Point, a bank extends a third of a mile.

## United States chart 21.

**Black River Bay.**—Bull Rock Point and Horse Island, a little more than a mile southeast of it, form the entrance points to Black River Bay, running northeastward  $5\frac{1}{2}$  miles to the entrance of Black River, the shores converging slightly as far as **Storrs Point**, on the southeast side of the bay. The bay has good water for  $3\frac{3}{4}$  miles, or nearly to Storrs Point, beyond which it expands and is filled with shallow flats. 5

The village of **Dexter** is situated on Black River  $1\frac{1}{4}$  miles above its mouth. Off the mouth of Black River, there is a bar, about three-quarters of a mile wide, which limits the draught of vessels trading to Dexter to 3 feet (0<sup>m</sup>9). Above this bar, there is a channel which will accommodate vessels drawing 8 feet (2<sup>m</sup>4). There are good wharves at Dexter with water deep enough for a draught of 8 feet (2<sup>m</sup>4). 10

**Sacketts Harbour** is situated on the south side of Black River Bay and a mile eastward from Horse Island. It is sheltered from the north by **Navy Point**, a spit of loose rock and gravel, from the outer end of which a shoal, with 2 feet (0<sup>m</sup>6) of water on it, extends 400 feet (121<sup>m</sup>9) in a southwesterly direction. On this shoal a stone dyke, ending in a square crib, extends 180 feet (54<sup>m</sup>9) from the point. The entrance to the harbour between the extremity of this shoal, and the railway wharf, on the south side, is 200 feet (61<sup>m</sup>0) wide, with 12 feet (3<sup>m</sup>7) of water. From the end of the wharves, for 250 feet (76<sup>m</sup>2) farther into the cove, the depth is from 6 to 8 feet (1<sup>m</sup>8 to 2<sup>m</sup>4). The harbour has an area of nearly seven acres and depths ranging from 8 to 12 feet (2<sup>m</sup>4 to 3<sup>m</sup>7). 15

The rails of the New York Central and Hudson River Railway are laid on to the wharf. 20

**Horse Island** forms the southern entrance point of Black River Bay, and is separated from the southeast shore by a narrow shallow channel. Shoal water extends half a mile southwest from Horse Island.

**Light.**—A light is exhibited, at an elevation of 57 feet (17<sup>m</sup>4), from a white, skeleton tower on the north side of Horse Island. It is known as Sacketts Harbour light. 30

**Henderson Bay** is a large, and, in the southwest portion, well sheltered indentation extending  $7\frac{1}{4}$  miles southwesterly from Horse Island, with depths of 5 to 7 fathoms (9<sup>m</sup>1 to 12<sup>m</sup>8), the land a short distance back rising to a height of 180 feet (54<sup>m</sup>9). 35

**Bass and Gull Islands**, small and connected by shoal water, are three-quarters of a mile apart, and lie, respectively, 1.6 and 2.6 miles southwesterly from Sacketts Harbour lighthouse. Shoal water extends a quarter of a mile northeast of Bass Island and a third of a mile southwest of Gull Island. The principal entrance channel to Henderson Bay is between Bass and Horse Islands and, between the shoal water on either side, is three-quarters of a mile wide. 40

**Henderson Harbour.**—From Horse Island, the shore of the bay trends southward  $2\frac{1}{4}$  miles to **Campbell Point**, close south of **Bedford Creek**, and, from this portion of the bay, shoal water extends from half to three-quarters of a mile. From Campbell Point, the shore runs southwest 5 miles to Henderson Harbour, an indentation a mile in length. The village of the same name stands upon the east point of the harbour. There is a depth of from 5 to 10 feet (1<sup>m</sup>5 to 3<sup>m</sup>0) at the wharves. 45

*United States chart 21.*

From Henderson Harbour, the shore of the bay trends northwest  $1\frac{1}{2}$  miles, and, then, northeast  $1\frac{3}{4}$  miles to a small peninsula, the indentation thus formed being known as **Whites Bay**. This peninsula is connected to the shore by a narrow isthmus, forming a shallow cove called **Snowshoe Bay**. **Six Town Point** is the northeast extremity of a string of narrow islands a mile in length, separated from the above-mentioned peninsula by a shallow channel.

**Lime Barrel Shoal**, with one foot ( $0^{\text{m}}3$ ) of water over it, extends a mile northeastward from Six Town Point, leaving a narrow channel between it and **Gull Island**. From this same point, a narrow bank extends half a mile northwest, and then runs for a mile southwest, leaving deeper water southeast of it.

**Light-buoy**.—A black light-buoy, showing a *flashing white* light, moored  $3\frac{3}{8}$  miles,  $231^{\circ}$ , from Sacketts Harbour lighthouse, marks an entrance for pleasure craft into Henderson Bay, across the shoal northeast of Six Town Point.

**Coast**.—From Snowshoe Bay, the bold outer coast changes its direction gradually from west to south, the distance to **Stony Point** (*Lat.  $43^{\circ} 50' N.$  Long.  $76^{\circ} 17' W.$* ) being about 5 miles, the land, a mile back, rising to a height of 60 feet ( $18^{\text{m}}3$ ).

**Light**.—A light is exhibited, at an elevation of 57 feet ( $17^{\text{m}}4$ ), from a white, square tower with dwelling attached, on **Stony Point**.

**Stony Island** lies 2 miles from the land a little north of **Stony Point**, the channel between being free from dangers. The island is 4 miles long northeast and southwest, and about  $1\frac{1}{4}$  miles in greatest width. Shoal water extends from the southwest end. The island is almost divided by a lake, and near the northeast end and on the northwest side of the island is a semicircular indentation, named **Dutch John Bay**, affording snug anchorage in 5 to 7 fathoms ( $9^{\text{m}}1$  to  $12^{\text{m}}8$ ), and protection from south and east gales. From the northeast point of the island, a bank extends a third of a mile.

**Light-buoy**.—Moored in 32 feet ( $9^{\text{m}}8$ ) of water, about a third of a mile off the northern end of the island, is a red conical light-buoy, exhibiting a *flashing white* light.

**Calf Island**, half a mile long, lies a third of a mile from the southwest extreme of **Stony Island**, being joined thereto by shoal water.

**Calf Island Spit**, with 7 feet ( $2^{\text{m}}1$ ) of water on it, is a dangerous shoal extending in a southwesterly direction a mile from **Calf Island**.

**Buoy**.—The outer end of this spit is marked by a black can buoy moored in 18 feet ( $5^{\text{m}}5$ ) of water, bearing  $295^{\circ}$ , distant 4.7 miles from **Stony Point** light.

**Shoal**.—A small, rocky shoal, having a least depth of about 12 feet ( $3^{\text{m}}7$ ), lies 4.7 miles,  $274^{\circ}$  from **Stony Point** light. It is nearly on the course from **Rochester** to **Sacketts Harbour**, and about 4,700 feet ( $1,432^{\text{m}}6$ ) south of **Calf Island Spit** can buoy.

**Little Galloo Island**, lying nearly in the middle of the passage between **Calf** and **Galloo Islands**, is a third of a mile long, and, from its northeast point a shoal, containing an inlet, extends 400 yards ( $365^{\text{m}}8$ ). South and southwestward from **Little Galloo Island** a shallow bank extends a third of a mile.

## United States chart 21

**Galoo Island**, in United States waters, is  $4\frac{1}{3}$  miles in length northeast and southwest, and a mile in breadth. A shoal extends half a mile southwestward from the lighthouse on the southwest extremity, and the northeast portion of the island has shallow water extending from it a third of a mile. There is a Coast Guard lifeboat station at **Gill Harbour** on the easterly side of the northern end of Galoo Island. There is shelter for small craft in the harbour.

**Light.—Fog Signal.**—A light (*Lat.  $43^{\circ} 53' N.$ , Long.  $76^{\circ} 27' W.$* ), is exhibited, at an elevation of 58 feet (17<sup>m</sup>7), from a grey, conical tower on the southwest end of Galoo Island. A fog diaphone is sounded at the station.

5

10

**North Pond** is the name given to a shallow indentation on the north side of Galoo Island, a little more than a mile west of its northeast extremity. Half a mile northward of North Pond is an isolated shoal with  $6\frac{1}{2}$  feet (2<sup>m</sup>0) of water on it.

## Charts 2060, 2064.

15

**Galoo Shoal** lies with 2 feet (0<sup>m</sup>6) of water on it, 600 yards (548<sup>m</sup>6) long and 300 yards (274<sup>m</sup>3) wide, a mile northwest of the southwest point of Galoo Island, with deep water between them.

**Light-buoy.**—The southwest end of Galoo Shoal is marked by a black conical light-buoy, No. 3, showing a *flashing white* light and bearing  $285^{\circ}$ , 20 miles distant 1.3 miles from Galoo Island lighthouse. Vessels should pass westward of this buoy.

20

**Main Duck Island**, in Canadian waters, lies about 8 miles westward from Galoo Island, and midway between Galoo and False Ducks Island. Its length northwest and southeast is 2 miles, and its greatest breadth at the northwest end is two-thirds of a mile. On the northeast side of the island is a small village occupied during the summer by a few families of fishermen. There is a small private wharf, the channel to which has been dredged 50 feet (15<sup>m</sup>2) wide and 7 feet (2<sup>m</sup>1) deep. From this wharf, a channel 6 feet (1<sup>m</sup>8) deep leads to the inner harbour.

25

30

**Light.—Fog signal.—Radio beacon.**—A light (*Lat.  $43^{\circ} 56' N.$ , Long.  $76^{\circ} 38' W.$* ) is exhibited, at an elevation of 74 feet (22<sup>m</sup>6), from a white, octagonal tower with a red roof on the west end of Main Duck Island.

A fog signal is sounded and a radio beacon is operated.

The radio beacon is synchronized with the fog signal for distance finding 35 purposes.

## Chart 2064.

**Yorkshire Island**, also in Canadian waters, half a mile long, lies a quarter of a mile from the east extremity of Main Duck Island, being connected thereto by shoal water. The north coasts of both islands are fairly steep-to, but, 40 from the south sides, shoals under the depth of 14 feet (4<sup>m</sup>3) extend half a mile. A spot, with 19 feet (5<sup>m</sup>8) of water, lies  $1\frac{1}{2}$  miles,  $243^{\circ}$ , from Main Duck Island light.

Between these two islands and Galoo Shoal, the passage, 6 miles wide, has depths varying from 6 to 30 fathoms (11<sup>m</sup>0 to 54<sup>m</sup>9).

45

## Chart 2064.

**Anchorage** in 9 to 10 fathoms ( $16^m5$  to  $18^m3$ ) will be found northward of the middle portion of Main Duck Island, affording good shelter in southerly winds.

5      **False Ducks Islands** are two in number, the eastern being known as **Swetman Island** and the western as **Timber Island**. The former is pear shaped, two-thirds of a mile long east and west by a quarter of a mile in greatest width near the eastern end, which is 8 miles,  $278^{\circ}$ , from the western extremity of Main Duck Island.

10     **Light.—Fog signal.**—A light is exhibited, at an elevation of 68 feet ( $20^m7$ ), from a white, circular tower on the eastern end of Swetman Island.

A fog diaphone is sounded at the station.

15     Timber Island, of which the northeastern portion is thickly wooded, and the remainder is pasture, is three-quarters of a mile long northeast and south-west, and one-quarter of a mile wide. The water is deep on all but the southwest side, off which, one-third of a mile southwestward, there is a depth of  $8\frac{1}{2}$  feet ( $2^m6$ ).

**Anchorage** is afforded, in 6 to 9 fathoms ( $11^m0$  to  $16^m5$ ), between Timber and Swetman Islands.

20     **False Ducks Bank** is the name given to the shallow flats which connect Prince Edward Point to Swetman and Timber Islands. On it, shoals under the depth of 6 feet ( $1^m8$ ), including **Duckling Reef** which is just awash, extend  $1\frac{1}{2}$  miles southwestward from Swetman Island, having a greatest breadth of three-quarters of a mile. The southeast side of False Ducks Bank runs southwest 25 a distance of 2 miles from the clean coast of the east point of Swetman Island. On this bank, there is also a depth of  $7\frac{1}{2}$  feet ( $2^m3$ ), a little over half a mile northeastward from the lighthouse on Prince Edward Point.

A short distance eastward of Prince Edward Point, there is a narrow winding channel, with a least depth of 13 feet ( $4^m0$ ), leading into the bay of the same 30 name (see page 19), but, as there are no clearing marks, it cannot be recommended to any one without local knowledge.

**Buoys.**—A red spar buoy is moored 4,200 feet ( $1,280^m2$ ),  $127^{\circ}$ ; a black spar buoy 1,700 feet ( $518^m2$ ),  $081^{\circ}$ ; and a red spar buoy 5,800 feet ( $1,767^m8$ ),  $035^{\circ}$ , respectively, from Prince Edward Point lighthouse.

35     **Traverse Shoal**, three-quarters of a mile in width east and west, under the depth of 5 fathoms ( $9^m1$ ), is the southwestern extension of False Ducks Bank. On it is a depth of 7 feet ( $2^m1$ ), bearing  $160^{\circ}$ , distant  $1\frac{1}{2}$  miles from Prince Edward Point lighthouse. The south edge of the shoal bears  $219^{\circ}$ , and is distant  $3\frac{3}{4}$  miles from False Ducks Islands lighthouse. Between the shoal 40 and False Ducks Bank, there are depths of a little less than 5 fathoms ( $9^m1$ ).

Vessels should not attempt to pass north of this shoal.

**Prince Edward Point**, (*Lat.  $43^{\circ} 56' N.$  Long.  $76^{\circ} 52' W.$* ), the southeastern projection of Prince Edward County, is fairly low. From the offing, it appears to be covered with trees.

45     A bank, with a mixed character of bottom, having less than 10 fathoms ( $18^m3$ ) of water upon it, and on which are situated William, Harris, and Psyche Shoals, connects Prince Edward Point to the False Ducks Islands. It also extends southeastward, leaving a passage  $1\frac{1}{4}$  miles in breadth between it and the bank, under the same depth, which spreads out southwestward of The 50 Ducks Islands.

## Chart 2064.

A cove runs in immediately northward of the lighthouse on the east extreme of Prince Edward Point. In 1954, a channel 80 feet (24<sup>m</sup>4) wide was dredged from the lake to a depth of 5 $\frac{1}{2}$  feet (1<sup>m</sup>6). The same depth can be carried to several small wharves in the northeast corner of the harbour. 5

**Light.**—A light is exhibited, at an elevation of 36 feet (11<sup>m</sup>0), from a white, square tower, with dwelling attached, on the eastern extremity of Prince Edward Point.

**William Shoal**, isolated, is a narrow rocky patch 2 miles long northeast and southwest under the depth of 30 feet (9<sup>m</sup>1). Its shoalest water, 12 feet (3<sup>m</sup>7), is on the northwest side of the middle portion of the patch, bearing 146° distant 1 $\frac{3}{8}$  miles from False Ducks Islands lighthouse. The depths between William Shoal and Swetman Island and False Ducks Bank range from 7 to 11 fathoms (12<sup>m</sup>8 to 20<sup>m</sup>1). 10

**Buoy.**—A red spar buoy is moored on the 4 $\frac{1}{2}$ -fathom (8<sup>m</sup>2) spot near the 15 west end of William Shoal.

**Harris Shoal**, isolated, has a least depth of 15 feet (4<sup>m</sup>6) over it. Under the depth of 30 feet (9<sup>m</sup>1), this rocky patch is a little over one mile in length east and west, almost joining William Shoal, and is one-third of a mile in width. The shoalest water is on the edge of the eastern end of the shoal, bearing 112°, 20 distant 3 $\frac{1}{8}$  miles from False Ducks Islands lighthouse.

**Psyche Shoal** (*Lat. 43° 55' N. Long. 76° 43' W.*), is rocky, isolated, small in extent, with deep water on all sides, although not quite so shallow as the last two mentioned dangers, there being 19 feet (5<sup>m</sup>8) least water upon it. It lies 113°, distant 4 $\frac{1}{4}$  miles from False Ducks Islands lighthouse. 25

**Light-and-bell-buoy.**—In 6 $\frac{1}{2}$  fathoms (11<sup>m</sup>9), on the southeast side of Psyche Shoal, a red steel cylindrical light-and-bell-buoy is moored. It shows a *flashing red* light. The buoy is fitted with a radar reflector.

**Caution.**—The passage between Main Duck and Swetman Islands, with its outlying dangers just described, should be approached with due caution. 30 In thick or foggy weather, vessels approaching the above passage from westward or southward, except if of light draught, should not shoal to a less depth than 7 fathoms (12<sup>m</sup>8). Great care should be exercised when approaching it from northward, as the soundings give little or no indication of the outlying dangers, there being from 12 to 19 fathoms (21<sup>m</sup>9 to 34<sup>m</sup>7) as close as one-third 35 of a mile from them in that direction.

## Charts 1459, 1477, 2064.

**Directions.—From Kingston to Lake Ontario.**—Proceed out on the line of Barriefield Common leading lights in one, bearing 037°, pass northward of Penitentiary Shoal red and black light-buoy, 61 T., and give the coast a 40 berth until abreast of Portsmouth front leading light. Then haul southward, bringing the leading lights in line astern, steering 198 $\frac{1}{2}$ °. The range is kept, passing between Melville Shoal and Middle Ground, until Main Duck Island light bears 090°, distant 1.8 miles.

The course and distance from the position west of Main Duck Island 45 lighthouse to Fairhaven, New York, is 181°, 38 $\frac{1}{2}$  miles; to Sodus 199°, 45 $\frac{1}{2}$  miles; to Charlotte 226°, 63 miles; to Niagara Bar 251°, 129 $\frac{1}{4}$  miles; the latter

Charts 1459, 1477, 2064.

course leads 2 miles south of Point Petre lighthouse, from which point vessels bound for Toronto may steer  $263^{\circ}$ , for 110 miles.

If proceeding from Kingston to Oswego, a vessel when abreast Ninemile Point lighthouse may steer  $176\frac{1}{2}^{\circ}$  for  $46\frac{1}{4}$  miles to the approach to Oswego Harbour. This course leads a vessel close westward of the bank from Pigeon Island.

**From Tibbetts Point to Lake Ontario.**—From a position with Tibbetts Point lighthouse bearing  $090^{\circ}$ , distant  $1\frac{3}{4}$  miles, the course and distance to Sodus, New York, is  $207^{\circ}$ ,  $61\frac{1}{2}$  miles. If bound to Oswego or to Fairhaven, from the position west of Tibbetts Point, steer  $201^{\circ}$  for a distance of  $15\frac{1}{2}$  miles, when Galloo Island lighthouse should bear  $090^{\circ}$ , distant  $3\frac{1}{2}$  miles. Haul southward, now, and steer  $180^{\circ}$  for Oswego, distant 28 miles, or  $195^{\circ}$  for Fairhaven, distant  $36\frac{3}{4}$  miles.

If bound to the western part of Lake Ontario, or to Charlotte, New York, a vessel may, from the position west of Tibbetts Point, steer  $207\frac{1}{2}^{\circ}$ , for a distance of  $16\frac{1}{2}$  miles, when Galloo Island lighthouse should bear  $090^{\circ}$ , distant  $5\frac{3}{4}$  miles, from which point proceed as desired.

The course and distance to Charlotte, from this point,  $231^{\circ}$ , 65 miles; to Niagara Bar,  $253^{\circ}$ , 132 miles, the latter course leading  $4\frac{1}{3}$  miles north of Olcott lighthouse. If bound to Toronto, from the position west of Galloo lighthouse, steer  $259^{\circ}$  for a distance of  $29\frac{1}{2}$  miles, when a vessel should be abreast Point Petre light, distant  $2\frac{1}{2}$  miles, then steer  $263^{\circ}$ , for 110 miles, to the harbour entrance.

**From Lake Ontario to Kingston.**—A vessel from westward, to run the passage between Main Duck Island and Swetman Island, should steer with Main Duck Island light bearing  $072^{\circ}$ , until Portsmouth leading lights come in line, bearing  $018^{\circ}$ , when this course is followed until about half a mile from Carruthers Point.

Being now well north of Snake Island Bank, a vessel should turn eastward, passing northward of Penitentiary Shoal red and black light-buoy, 61 T, giving the shore a berth, until Barriefield Common leading lights are in line bearing  $037^{\circ}$ , on which marks proceed into Kingston Harbour. To those well acquainted, there is the old channel, with depth of 14 feet (4<sup>m</sup>3), southeast of Snake Island Bank.

A vessel from Oswego, steering  $356^{\circ}$  from that port, should pass Pigeon Island lighthouse on the starboard side, distant one mile, and continue until Ninemile Point lighthouse is abeam and three-quarters of a mile off. Thence proceed as directed before.

**From Lake Ontario to Tibbetts Point.**—From a position with Galloo Island lighthouse bearing  $090^{\circ}$ , distant  $3\frac{1}{2}$  miles, the course and the distance, to a position with Tibbetts Point lighthouse, bearing  $090^{\circ}$  distant  $1\frac{3}{4}$  miles, is  $021^{\circ}$ ,  $15\frac{1}{2}$  miles. This course leads 2 miles northwest of Galloo Shoal light-buoy, No B3, 2 miles southeast of East Charity Shoal lighthouse (see page 11), and  $1\frac{1}{4}$  miles southeast of Allan Otty Shoal.

If from the western part of the lake, a vessel in daylight with fine and clear weather, may, with Main Duck Island lighthouse bearing  $090^{\circ}$ , steer  $059^{\circ}$  for 13 miles, when East Charity Shoal lighthouse should bear northwestward distant  $1\frac{1}{4}$  miles. From this position, steer  $027^{\circ}$  for 6 miles when Tibbetts Point lighthouse should bear  $090^{\circ}$  distant  $1\frac{3}{4}$  miles.

Or, an alternative track, leading northward of the Charity Shoals, may be taken. From the above position, westward of Main Duck Island, steer  $045^{\circ}$

## Charts 1459, 1477, 2064.

for  $11\frac{1}{2}$  miles, when Charity Shoal spar buoy should bear southeastward, distant two-thirds of a mile. This course leads  $1\frac{1}{4}$  miles northeast of Main Duck Island. From the position abreast the spar buoy, steer  $056^\circ$ ,  $6\frac{1}{2}$  miles, when Tibbetts Point lighthouse should bear  $090^\circ$ , distant  $1\frac{3}{4}$  miles. 5

## Charts 2060, 2064.

**Prince Edward Bay** is the large bight formed by the east coast of Prince Edward County between the point of the same name and Pleasant Point.

From the northeast end of Prince Edward Point to **Halfmoon Point**, (*Lat.  $43^\circ 56' N.$  Long.  $76^\circ 57' W.$* ),  $4\frac{1}{2}$  miles distant, the shore of Prince Edward Bay trends westward for a distance of  $3\frac{1}{2}$  miles. It then turns northwestward toward the latter point. This coast is fairly clean and steep-to except for a small patch, with 19 feet ( $5^m8$ ) of water upon it, lying eastward distant half a mile from the latter point. Halfmoon Point is clean and fairly steep-to. 10

**Flat Point**,  $2\frac{1}{2}$  miles westward of Halfmoon Point, has shallow water 15 extending 325 yards ( $297^m2$ ) eastward on its east side. The shorebank runs out two-thirds of a mile eastward and one-quarter of a mile northward of the point.

West of Flat Point, the shore turns abruptly southward to form a shallow bay three-quarters of a mile wide and  $1\frac{3}{4}$  miles long, at the head of which is situated the village of **South Bay**, and on the west side the village of **Port Milford**. The latter has several wharves, with depths to 10 feet ( $3^m0$ ). 20

**Waupoos Island** is situated on the north side of Prince Edward Bay,  $2\frac{3}{4}$  miles northward of Halfmoon Point. It is 2 miles long northeast and southwest and is partly wooded and partly cultivated.

The passage on the northwest side, separating the island from the main shore, has a least breadth of one-third of a mile with a least depth of  $7\frac{1}{2}$  feet ( $2^m3$ ). A shallow flat runs out one-third of a mile northward of the northern side of the island. 25

Deep water approaches to within 300 yards ( $274^m3$ ) of the south side of the island. 30

**Waupoos wharves.**—The passage on the west side of Waupoos Island, having a least breadth of one-third of a mile, with a least depth of 12 feet ( $3^m7$ ), leads to the two wharves of the village of Waupoos on the mainland. Both wharves are 100 feet ( $30^m5$ ) long, and 7 feet ( $2^m1$ ) may be carried to their outer ends. 35

**Green Islet**, low, very small in extent, is the apex of a reef consisting of gravel and boulders over rock, which, at high water, may be just awash. It lies  $218^\circ$ , distant 2 miles from Cape Vesey. Shoals under 6 feet ( $1^m8$ ) extend one-quarter of a mile northeastward and southeastward, and half a mile southwestward from it. The west side of Green Islet is connected with the main shore northward, and also with the east side of Waupoos Island, by a bank of shoal water. The 10-fathom ( $18^m3$ ) line approaches to within a little over one-third of a mile eastward of the islet. 40

**Cape Vesey** (*Lat.  $44^\circ 02' N.$  Long.  $76^\circ 54' W.$* ), a conspicuous cliff with perpendicular face, rises abruptly from a steep-to shore to more than 150 feet ( $45^m7$ ) above the lake. It bears  $320^\circ$ , distant  $7\frac{3}{4}$  miles from False Ducks Islands lighthouse, and  $208^\circ$ , distant 6 miles from Pleasant Point lighthouse. 45

From Cape Vesey, the shore trends northeastward, forming a double curve, 6 miles to Pleasant Point. At the cape, and also for a distance of one mile westward along the shore, the 10-fathom ( $18^m3$ ) line is close in, but towards 50

*Charts 2060, 2064.*

Pleasant Point, the shorebank varies between one-third and three-quarters of a mile in width.

*Chart 2064.*

5      **Upper Gap** is the name given to the passage between Pleasant Point and the west end of Amherst Island. It is  $1\frac{1}{2}$  miles in width. Shoals under 18 feet (5<sup>m</sup>5) extend half a mile northeastward and the same distance eastward from the lighthouse on Pleasant Point. A small patch, with 17 feet (5<sup>m</sup>2) of water over it, lies 068° distant  $1\frac{1}{2}$  miles from the same lighthouse. There is a deep 10 channel between the latter shoal and the west side of Amherst Island, but vessels passing midway between the island and Pleasant Point will find 27 feet (8<sup>m</sup>2) of water.

**Buoys.**—A black spar buoy is moored near the edge of the 5-fathom (9<sup>m</sup>1) bank, about 4,300 feet (1,310<sup>m</sup>6), 056° from Pleasant Point lighthouse. 15 A red light-buoy, showing a *flashing red* light, is moored about 4 miles southeastward of Pleasant Point, and marks a 4-fathom (7<sup>m</sup>3) patch. A red light-buoy, showing a *flashing red* light, is moored about 1.9 miles eastward of Pleasant Point, and marks the edge of a shoal patch extending southward from Bluff Point. A black light-buoy, showing a *flashing white* light, is moored off the 20 northeastern edge of a 15-foot (4<sup>m</sup>6) shoal, situated about 5 cables southwestward of Pig Point. A red spar buoy, fitted with a radar reflector, is moored about 2 cables westward of Pig Point.

The Bay of Quinte, from Pleasant Point westward, the Murray and Trent Canals, are described in Chapter II.

25      **Directions.—From Lake Ontario to Bay of Quinte.**—A vessel from westward should steer with Main Duck Island lighthouse bearing 251°, and when Prince Edward Point lighthouse bears 342°, distant 4 miles, it may haul northward steering 025°, with False Ducks Islands lighthouse over the port bow. After running  $4\frac{1}{3}$  miles, the vessel should be abreast of and a quarter of a mile 30 from the latter, having passed close to the deeper water of William Shoal, but three-quarters of a mile northwestward of its shallowest part 12 feet (3<sup>m</sup>7). Then rounding the lighthouse point of the island, steer 350° for a distance of 13 miles, passing in the middle of the Upper Gap, or three-quarters of a mile eastward of Pleasant Point lighthouse. When well out of the Upper Gap, 35 haul southwestward, keeping in the middle of Adolphus Reach (see page 32).

Or, a vessel may steer with Main Duck Island lighthouse bearing 251°, until abreast Psyche Shoal light-buoy, when haul around the buoy and steer 335°,  $16\frac{1}{2}$  miles for the middle of the Upper Gap.

## RIDEAU RIVER AND CANAL NAVIGATION

Charts 1575, 1576.

The **Rideau Canal** establishes a navigable waterway between the Ottawa River at Ottawa and the easterly end of Lake Ontario at Kingston, passing over the summit which lies between the Ottawa Valley and that of the St. Lawrence. The general route of the canal may thus be described: 5

By a series of eight locks in flight, it first ascends the steep escarpment from the Ottawa River and, proceeding across the city by an artificial cutting about five miles in length, enters the Rideau River at the Hogsback locks. The course of this river is then followed to Smiths Falls, distant about 59 miles from 10 Ottawa, various dams and locks overcoming the differences in level encountered along the route. From this point, *via* Poonamalie lock, entrance is made into the first two large expanses of water known, respectively, as the lower and upper Rideau Lakes. At the upper lake, the summit level of the canal, about 275 feet (83<sup>m</sup>8) above that of the Ottawa River, is reached. From this lake, communication is made with Newboro Lake, another large body of water. The route then passes in succession through Clear Lake, Indian Lake, Opinicon Lake, Sand Lake, Whitefish Lake, and Cranberry Lake. 15

Outlet from Cranberry Lake is through the Cataraqui River, dammed like the Rideau to make it navigable. Through two successive expanses of drowned 20 land behind these dams the channel runs to Kingston Mills, where by a single lock and three locks in flight, it drops into the natural channel of the Cataraqui and follows that river for about six miles to the harbour of the City of Kingston, about 161 feet (49<sup>m</sup>1) below the summit level.

The Tay branch of the canal affords communication *via* the Tay River 25 between Beveridge Bay, about ten miles beyond Smiths Falls on the lower Rideau Lake, and the town of Perth.

From the summit level of the canal, the descending reaches on both the Ottawa and St. Lawrence Valley slopes are supplied also by reserve waters tributary to them. The water supply of the entire canal may be summarized 30 as follows:—

1. The summit level, supplied by the Wolf Lake system discharging into the upper Rideau Lake.

2. The Northeasterly descending level to Ottawa, supplied by the Tay River system discharging into the lower Rideau Lake. 35

3. The southwesterly descending level to Kingston, supplied by the Mud or Newboro Lake system discharging into Opinicon Lake and further supplemented by the flow from Loughborough Lake.

Vessels passing through the Rideau Canal are limited to 110 feet (33<sup>m</sup>5) in length and 30 feet (9<sup>m</sup>1) beam. The official draught for vessels is 5 feet 40 (1<sup>m</sup>5), but vessels drawing up to 5' 6" (1<sup>m</sup>6) may normally pass all sections of the canal, except during dry seasons, when the draught in some sections is curtailed.

Owing to the rounded inverted arch bottoms of certain locks, barges, scows and other craft with square, flat bottoms are limited to a draught of 4 feet 45 (1<sup>m</sup>2), unless they are somewhat narrower than 30 feet (9<sup>m</sup>1).

## Charts 1575, 1576.

The following is a summary of mileage and other data relating to this canal:—

Navigation Distances—		Miles
5	Ottawa River to summit level at Newboro.	84.74
	Newboro to Lasalle Causeway, Kingston.	38.79
		123.53
10	South Rideau Branch to Kemptville.	2.90
	Tay Branch, Big Rideau Lake to Perth.	6.82
	Portland Branch on Big Rideau Lake.	6.48
	Westport Branch on Upper Rideau Lake.	5.25
	Morton Branch on Whitefish Lake.	1.62
	Seelys Bay Branch on Cranberry Lake.	0.65
15		147.25
Total Lift and Number of Locks at Normal Navigation levels		Number of locks
	Ascending from Ottawa to summit level	
20	(Upper Rideau).	33
	Descending from summit level to Kingston..	14
		47
25	Tay Branch ascending to Perth.	2
		49
		464 (141 <sup>m</sup> 4)
	Dimensions of all locks.....	134 feet x 33 feet (40 <sup>m</sup> 8 x 10 <sup>m</sup> 1)
	Draught.....	Normal, 5' 6" (1 <sup>m</sup> 6); Minimum, 5' 0" (1 <sup>m</sup> 5)
Breadth of Canal Reaches		
30	Main Channel, bottom.....	60' (18 <sup>m</sup> 3)
	top.....	80' (24 <sup>m</sup> 4)
	Tay Branch, bottom (in rock).....	40' (12 <sup>m</sup> 2)
	“ (in clay).....	60' (18 <sup>m</sup> 3)
	top.....	80' (24 <sup>m</sup> 4)
35	Minimum overhead clearance:	
	Ottawa section only.....	26' 6" (8 <sup>m</sup> 0)
	Ottawa to Becketts.....	27' 0" (8 <sup>m</sup> 2)
	Becketts to Newboro.....	27' 5" (8 <sup>m</sup> 3)
	Newboro to Kingston.....	30' 0" (9 <sup>m</sup> 1)
40	Normal length of navigation season:	
	Locks put into operation with skeleton staff, May 1.	
	Full operating staff commences about May 20.	
	Skeleton operating staff commences again about October 15.	
	Operation of locks ends about November 30.	
45	Sunday operation usually commences for some sections on the third Sunday in May and continues to the last Sunday of September. All sections are usually open from the last Sunday in June to the second Sunday in September. Operation on Sundays is restricted to certain hours, as specified each season by Notices to Mariners.	

Charts 1575, 1576.

## Rideau Canal—Mileage and General Data

Charts 1575, 1576.

## Rideau Canal—Mileage and General Data—Con.

Miles from Ottawa	Structure, Locality, etc.	LOCKS				Over- head Clear- ance	Canal Prism
		Length Between Hollow Quoins	Mini- mum Width	Normal	Average		
				Draught	Lift		
ft. in.	ft. in.	ft. in.	feet	ft. in.	miles		
72.42	Diversion to Portland						
78.90	Portland Wharf						
		Channel to Portland Wharf on South shore Big Rideau Lake					
80.02	Lock 35—The Narrows.....	134 0	33 0	5 6	4.0		0.04
80.02	Bridge 27—swing—The Narrows						
80.08	Entrance to Upper Rideau Lake (Summit level 407.0 above M.S.L.)						
80.08	Diversion to Westport.....						
85.33	Westport Wharf.....						
		Channel to Westport Wharf on West shore Upper Rideau Lake					
84.27	C.N.R. high level bridge.....					34.0	
84.34	Bridge 29—high level, highway.....	134 0	33 0	5 6	7.5	27.5	
84.74	Lock 36—Newboro.....						1.06
89.74	C.N.R. high level bridge.....						
90.00	Lock 37—Chaffeys.....	134 0	33 0	5 6	11.0	34.0	
90.00	Bridge 30—swing—Chaffeys.....						0.45
92.15	Lock 38—Davis.....	134 0	33 0	5 6	9.0		
96.45	Lock 39—Jones Falls.....	134 0	33 0	5 6	15.0		
96.48	Jones Falls Basin.....						
96.59	Locks 40 to 42 in flight—Jones Falls.....	134 0	33 0	5 6	43.0		
96.63	Bridge 33—swing—Jones Falls, over Lock 41						
99.38	Diversion to Morton						
101.00	Morton wharf and dam						
		Channel to Morton Wharf on Morton River					
100.88	Diversion to Seeleys Bay						
101.53	Seeleys Bay wharf						
		Channel to Seeleys Bay Village and Wharf					
103.08	Bridge 36—swing—Brass' Point						
107.28	Locks 43 and 44 in flight—Upper Brewers Mills.....	134 0	33 0	5 6	18.50		1.45
107.31	Bridge 37—swing—Upper Brewers, over Lock 44.....						
109.06	Bridge 39—swing—Lower Brewers, over entrance to Lock 45.....						
109.06	Lock 45—Lower Brewers Mills or Washburn	134 0	33 0	5 6	13.0		4.25
118.81	Lock 46—Kingston Mills.....	134 0	33 0	5 6			
118.81	Bridge 41—swing—Kingston Mills						
118.83	Kingston Mills basin.....						
118.91	Locks 47 to 49 in flight—Kingston Mills.....	134 0	33 0	5 6	44.0		0.25
118.93	C.N.R. high level bridge over Locks 47-48.....					30 0	
123.53	Kingston-LaSalle Causeway bascule bridge						
	(Lake Ontario—Mean level 245.8 above M.S.L.) (Standard low water, 243.0 above M.S.L.)						17.72

## OTTAWA RIVER ROUTE

NOTE—A description of the Ottawa River route from the City of Montreal, with details of its canals and locks and directions for navigation, is contained in the "St. Lawrence River Pilot, Quebec to Kingston."

The information supplements that shown on five sectional charts of the Ottawa River, which cover the route from the terminus of the Rideau Canal to the St. Lawrence River at Ste. Anne.

## CANAL RULES AND REGULATIONS

For the assistance of mariners and shipping navigating the canalized portions of the Rideau, Trent, and Ottawa systems, the following paragraphs, as numbered, and concerning generally those canals dealt with in the "Great Lakes Pilot", have been extracted from "Rules and Regulations for the Guidance and Observance of those using the Canals of the Dominion of Canada", published by the Department of Transport.

(For further details, penalties for non-observance, etc., the above-mentioned publication should be consulted.)

3. (1) The Canal Regulations are made under the authority of Sections 10 25 and 26, Chapter 79, Revised Statutes of Canada, 1952.

### Customs Clearance Papers

7. Customs clearance papers of vessels must be produced and shown to any superintendent or lockmaster when required or passage of canal may be refused.

15

### Time When Canals Are Open

8. The canals will be open for navigation throughout each day and night, except Sundays, during the season of navigation, with the following exceptions:—

- (a) The season of navigation on canals other than Main Route canals 20 may start later and end earlier or later than on those constituting the Main Route. Information regarding the duration of the season of navigation on any canal for any year may be obtained from the Superintendent Engineer of such canal.
- (b) Most canals except Main Route canals have restricted Sunday hours, 25 and announcement will be made each year at the time of opening of navigation of the Sunday opening rules as applying to that navigation season for these canals.
- (c) On the Trent Canal, the railway movable bridge at Hastings is operated twenty-four hours daily except Sundays and all other railway movable 30 bridges are operated from 6.00 a.m. to 10.00 p.m. daily except Sundays or during such other hours as may be determined from time to time by the Director.
- (d) On the Rideau Canal, the railway movable bridge at Smiths Falls is operated daily from 6.00 a.m. to 10.00 p.m. or during such other hours 35 as may be determined from time to time by the Director.

### USE OF CANALS TO BE AT OWNER'S RISK

9. All vessels or rafts, when plying on or passing through the canals, shall do so entirely at the risk of their respective owners; and neither Her Majesty nor any agent or employee of Her Majesty shall be held liable or 40 responsible for any compensation to the owner of any such vessel or raft if for any reason whatever it be prevented from using any canal, or part thereof, or be damaged, destroyed, detained or delayed while passing through the same.

### LET PASS REQUIREMENTS

10. (1) Except as provided in paragraph (5) of this regulation, no vessel 45 or raft shall pass through or use any canal or part thereof without a valid Annual or Trip Let Pass issued with respect to such vessel as set out in

paragraphs (2) and (3) respectively of this regulation, and such pass shall be shown to any lockmaster or other officer whenever and as often as required by such officer.

5 (2) An "Annual Let Pass", good for passage through any canal under the jurisdiction of the Department at any time during the season of navigation for which it is issued, may be obtained from any Superintending Engineer (or in the case of pleasure boats of forty (40) feet (12<sup>m</sup>2) or less in length, from the local statistical officer, lockmaster or bridgemaster) on completion of an Annual Let Pass Agreement.

10

#### DRAUGHT OF WATER

14. (1) Every vessel, drawing five feet or over, navigating any canal shall be correctly and distinctly marked and gauged at the bow and stern so as to show her exact draught fore and aft, and no vessel without such gauge marks shall enter any canal.

15 (2) Whenever required, the master of any vessel shall produce a certificate, duly sworn to, from the last drydock the vessel was in, that her draught marks are correct.

20 (3) No vessel shall enter or pass through any lock or reach of any canal unless the depth of water on the controlling point for draught in such lock or reach exceeds by at least three inches the maximum draught of the vessel at the time.

#### VESSELS IN TOW

18. (1) Any vessel not using steering apparatus which is satisfactory in the opinion of the Director shall, when being towed by tractor or animal, be fastened to the source of traction by a tow line in such a way that there shall be at least one hundred (100) feet (30<sup>m</sup>5) between the point where the line is fastened to the source of traction and the point where the line is fastened to such vessel.

30 (2) Except with the special permission, in writing, of the Director, the Superintending Engineer or the Superintendent, no more than one vessel shall at one time be towed by another vessel on any Ontario-St. Lawrence Canal or on the Welland Ship Canal.

35 (3) Except with the special permission, in writing, of the Director or the Superintending Engineer, no vessel shall, on any Main Route canal, except on the Welland Ship Canal, be fastened alongside its towing vessel.

(4) When so required by the Director, the Superintending Engineer or the Superintendent, two tugs or other towing vessels shall be provided for towing any vessel through any Main Route canal.

#### SPEED OF VESSELS

40 19. Every vessel, after entering a canal, shall proceed, in the opinion of the Director, at a reasonable speed so as not to cause undue delay to vessels navigating in the same direction, but no vessel shall proceed in any canal at a speed greater, in the opinion of the Director or the Superintending Engineer or the Superintendent, than is reasonable and proper having regard to the traffic and use of such canal or so as to endanger the life or limb of any person or the safety of any property, which speed, when not otherwise specified, shall be taken as not exceeding six miles an hour.

## LIGHTS ON VESSELS

20. Every vessel or raft navigating or lying moored in any canal or in any navigable channel between canals shall comply with the Rules of the Road issued by the Department respecting lights, applicable to the area in which such canal or channel is situated. No vessel shall use a searchlight for ordinary navigating purposes in canal waters. If it becomes necessary to use a searchlight in a case of emergency, then the rays of the searchlight shall not be directed toward the pilot house or navigation bridge of another vessel nor towards the operating house of a canal bridge, or the control room of a canal lock, nor along the tops of lock walls on which canal employees are on duty. Vessels when lying at a pier awaiting their turn to enter a lock shall be considered as still under way and their lights are to be regulated accordingly.

5

10

## PASSING OF VESSELS

21. (1) The passing of vessels meeting or overtaking one another in a canal shall be governed by the Rules of the Road issued by the Department in such connection, applicable to the area in which such canal is situated, except as follows:—

15

- (a) When meeting in East Basin 1 of the Lachine Canal, each vessel, unless both be tugs or other small boats, shall pass on the starboard side of the other.
- (b) When two vessels are approaching from opposite directions a swing bridge which does not provide separate channels for up and down traffic and which curtails the normal width of the navigation channel, the downbound vessel shall have the right of way, the upbound vessel holding back so that the vessels will pass each other at least 300 feet (91<sup>m</sup>4) below the bridge.
- (c) Except in the Welland Ship Canal, when two vessels, either one of which exceeds 100 feet (30<sup>m</sup>5) in length, are approaching a bend in a canal from opposite directions, the downbound vessel shall have the right of way and the upbound vessel shall check its speed so as to avoid meeting in the bend.
- (d) No vessel shall attempt to pass another vessel while within 300 yards (274<sup>m</sup>3) of a lock, guard gate or bridge which both are approaching.

20

25

30

## PASSING MOORED VESSELS

2. Any vessel passing a vessel or vessels moored to a wharf, pier or the bank of any canal and any vessel passing construction or maintenance equipment working in a canal shall proceed at dead slow engine speed while so passing.

35

## PRECEDENCE AT RAILWAY BRIDGES

23. Precedence at railway movable bridges shall, at all times, be given to canal traffic, but no unreasonable delay shall be caused by any vessel to railway traffic; the Director, or the Superintending Engineer or the Superintendent, shall be the judge as to the reasonableness of the delay. If the signal for the bridge is given by any approaching train while a vessel is between a quarter of a mile and a half mile distant from the bridge, the vessel shall slow down, stop if necessary, and await the passage of the train.

40

45

## VESSELS APPROACHING LOCK OR BRIDGE

24. (1) A whistle, bell or horn shall be sounded at least half a mile before a vessel reaches any lock or movable bridge as an approach signal from the vessel; provided, however, that such signal shall be given to such extent only as, in the opinion of the Director, or the Superintending Engineer or the Superintendent, is necessary to give the officer in charge of such lock or bridge timely warning to make preparations to receive the vessel at the lock or to allow it to pass through the bridge opening.

## VESSELS WAITING AT LOCKS

10 25. (1) All vessels approaching a lock, while any other vessel is in or about to enter the same, shall be stopped and made fast to the posts or other devices placed for that purpose and shall be kept so tied up until directed by the officer in charge to proceed.

15 (2) When several vessels are waiting to enter any lock or canal, they shall lie in single tier, and at a distance of not less than 300 feet (91<sup>m</sup>4) from such lock or canal, except where local conditions may, in the opinion of the Director, or the Superintending Engineer or the Superintendent, otherwise require.

(3) For the purpose of passing through a lock or canal, each vessel shall advance in the order in which it arrived at such lock or canal except that,—

20 (a) Specific classes of vessels shall follow such order of precedence as may be established from time to time by the Director.

(b) A vessel small enough to lock with a preceding vessel shall advance for that purpose ahead of its regular turn, if so instructed by the lock-master.

25 (c) Vessels with barges in tow and, in special circumstances, other vessels, shall follow such order of precedence as may be determined by the Superintending Engineer or the Superintendent.

(d) An approaching vessel which is within such distance of a lock that she would be seriously or unduly delayed if another vessel which has arrived at the lock before her and over which she has precedence, under the provisions of sub-paragraphs (a), (b) and (c) of this paragraph, were locked before her, shall be accorded such precedence as she would have had if she were already at the lock.

## CARE IN ENTERING AND LEAVING LOCKS

35 26. (1) No vessel shall attempt to enter or leave a lock until the gates are fully opened. The engines shall be stopped while the propeller wheel is passing over the mitre sills.

40 (2) The rate of speed of any vessel in entering a lock, when the bow of the vessel has reached the open gates, shall be such that the vessel can be moved into position by her lines alone without depending on the propeller wheel, and the engine shall be stopped when the bow of the vessel has reached the middle of the lock between the upper and lower gates, the remaining distance to be travelled by the vessel to be effected and the vessel controlled by means of lines attached to winches installed on the vessel's deck.

## VESSEL MEN TO ASSIST IN PASSING VESSELS

27. Whenever any vessel is passing through a lock or bridge, the vessel's crew shall, whenever and in such numbers as required by the officer in charge of such lock or bridge, be assigned to assist in working the lock or bridge to pass

the said vessel through it, during which time the vessel men so assigned shall be subject to, act exclusively under, and comply with the instructions given them by the said officer.

#### VESSEL LINES REQUIRED

29. (1) Every vessel of two hundred registered gross tons and under navigating the canals shall be provided with at least two good and sufficient lines or hawsers, one at the bow and one at the quarter, and every vessel of more than two hundred registered gross tons shall be provided with at least four good and sufficient lines or hawsers, two leading astern, one leading ahead and one abreast line. When locking, such lines shall be made fast to the snubbing posts on the bank of the canal and lock; the two lines leading astern of a vessel of more than two hundred registered gross tons, pulling evenly, shall be made fast to separate snubbing posts; each line shall be attended by one of the vessel's crew, to check the speed of the vessel while entering the lock, to prevent it from striking against the gates or other parts of the lock, and to keep it in proper position while the lock is being filled or emptied. 5 10 15

(2) Some slight variations as to relative position in placing of lines exist on the Main Route Canals. In each case the instructions of the lockmasters are to be followed.

(Note Regulation 106 for Welland Ship Canal.) 20

30. No vessel when blown or otherwise held on a lee bank in a canal shall attempt to work herself off with her engine and wheel but shall run lines to the opposite side of the canal and heave out into the channel with her capstan. 25

#### MOORING AND FASTENING

31. (1) No vessel shall, whilst in any canal waters, be fastened or moored in such manner as to obstruct navigation. 25

(2) An order given by the Director or the Superintending Engineer or the Superintendent with regard to the position, mooring, fastening or removal of any vessel in a canal, including its basins and approaches, or with regard to the accommodation to be given by the master of such vessel to the master of another vessel shall be immediately complied with and obeyed. In the event of any such order not being complied with or obeyed within such period of time as is deemed reasonable by the Director or the Superintending Engineer or the Superintendent, the Director, or the Superintending Engineer or the Superintendent may cast off or cut away the hawsers or other fastenings of such vessel or cut away any ring or post to which such hawsers or other fastenings may be attached, and the Director or the Superintending Engineer or the Superintendent may take possession of such vessel and remove it to such point as he may see fit and he shall have the power of employing such number of men as he deems reasonable for that purpose, all at the expense of the owner of such vessel, and the owner of such vessel shall be liable for, and shall pay, all damages caused by or incidental to and costs incurred on account of any action taken by the Director or the Superintending Engineer or the Superintendent under the provisions of this regulation. 30 35 40

#### TYING TO ELECTRIC TRANSMISSION, LIGHT, TELEPHONE OR TELEGRAPH POLES 45

32. No vessel or raft shall, under any circumstances, place a line of any nature on any electric transmission, light, telephone or telegraph pole or iron railing situated on canal property.

## BERTHS FOR VESSELS

33. (1) Berths for all vessels or rafts, when loading, unloading or stopping in any canal or approach thereto, will whenever necessary, be assigned by the Director or the Superintending Engineer or the Superintendent.

5 (2) Such officer shall have power to change such berths from time to time as he may see fit.

(3) If the wharves are full, such vessels or rafts shall lie where indicated by such officer until a berth has been so assigned.

## LOADING OR UNLOADING OTHERWISE THAN AT A WHARF

10 36. No vessel shall take on or discharge passengers or goods at any place other than a regular wharf, as determined by the Superintending Engineer, without the express permission in writing of the Director or Superintending Engineer.

## EXPLOSIVES, DANGEROUS CARGO, OIL PRODUCTS, ETC.

15 46 (1) No vessel whose cargo consists in whole or in part of high explosive or dangerous goods, such as dynamite, nitroglycerine, gun powder, blasting caps, detonating fuses, corrosive liquid, oxidizing material, etc. shall pass through any portion of any canal unless and until written authority therefor is given by the Minister and then only subject to such conditions and restrictions 20 as by such written authority are laid down.

(2) No such high explosive or dangerous goods shall be brought on carried over or through or stored or used on canal land unless and until written authority therefor is given by the Minister and then only subject to such conditions and restrictions as by such authority are laid down.

## 25 WARNING SIGNALS ON VESSELS WITH DANGEROUS CARGOES

47. A vessel whose cargo consists, in whole or in part, of explosives or inflammable or otherwise dangerous liquids shall fly by day a red flag and at night shall show a red light. These danger signals shall be such as to be visible all around at a distance of at least one mile and shall be displayed at the 30 masthead or at another conspicuous position acceptable to the Superintendent.

## DROPPING ANCHOR

51. No anchor shall be dropped from any vessel in any lock or guard gate or entrance thereof or in any basin or navigation channel of any canal unless an emergency exists. The action of dropping an anchor shall be reported to 35 the Superintending Engineer or the Superintendent immediately and the owner of the vessel shall be responsible for all damages, repairs or salvage caused or necessitated by such action.

## BLOWING OFF TUBES

52. Vessels while within canal waters shall take the necessary precautions 40 to avoid the issue of sparks or excessive smoke. No vessel shall blow off boiler tubes in any canal or harbour.

## REFUSE

53. (1) No person shall throw, dump or deposit, or cause to be thrown, dumped or deposited any ordure, refuse, filth, garbage, dead animal, dirt, ashes, 45 putrid substance of any kind, stones, ballast, timbers, brush or other rubbish

or papers within any canal boundaries or along or over the canal banks. All papers, litter, refuse, garbage or rubbish of any kind shall be placed in cans where provided for that purpose.

(2) No person shall throw, dump or deposit garbage, ashes, paper, ordure, litter, or other rubbish from any vessel into canal waters. 5

**ICE.—Freezing over of St. Lawrence River.**—The upper St. Lawrence usually freezes over from shore to shore for varying periods during the late winter months, except in the rapids sections. Between Prescott and Ogdensburg ice-breaking ferries maintain a passage the year round. At the upper end, there is regular passage for sleighs and motor vehicles for from two to three months 10 over the ice from Kingston to Cape Vincent, N.Y., via Wolfe Island. It is stated that some winters the waters of Lake Ontario freeze over for upwards of ten miles west of Kingston.

It has often happened that horse teams crossed the river from Gananoque to Clayton, N.Y. In this section, it is reported as dangerous to attempt to cross 15 on the ice east of Gananoque and west of Rockport, except after extreme cold weather, and with the services of a guide.

From Alexandria Bay, N.Y., it is seldom possible to cross for more than a period of two weeks and the safer route is from Clayton, N.Y., to Gananoque.

During the eighty-nine year period from 1857 to 1946, the earliest date of 20 closing of navigation at Kingston Harbour was December 15 and the earliest date of opening, March 2.

At Cape Vincent, N.Y., the average dates of season of navigation are opening, April 4, and closing, December 25.

## CHAPTER II

### LAKE ONTARIO

#### BAY OF QUINTE, MURRAY CANAL, TRENT-SEVERN WATERWAY

*Charts 2006, 2064.*

5      **General description.**—Bay of Quinte is a long, winding, comparatively narrow body of water lying between Prince Edward County and Amherst Island in Lennox and Addington County on the south, and a small part of Northumberland, Hastings, Lennox, and Addington Counties on the north side.

10     Since the construction of the Murray Canal in the southeast corner of Northumberland County, the western extremity of Bay of Quinte has been connected with Presqu'ile Bay (see page 55), and Prince Edward County has been separated from the mainland, forming an island, thus affording an inland route between Kingston and Presqu'ile Bay for vessels of light draught. Vessels drawing less than 12 feet (3<sup>m</sup>7) of water can proceed as far up as Trenton, near 15 the west end of the bay where there is 10½ feet (3<sup>m</sup>2) at the public, or Government wharf. Murray Canal has a depth of 10 feet (3<sup>m</sup>0) below the Standard low water adopted by Canada; (243 feet (74<sup>m</sup>1) above mean tide New York, the mean summer level of the lake is usually 1 to 3 feet (0<sup>m</sup>3 to 0<sup>m</sup>9) higher than this. (See page xxv).

20     **Caution.**—The Bay of Quinte is buoyed with respect to entrance from the east at Kingston, with red buoys to starboard and black buoys to port when passing through, westward bound.

**Pilotage.**—(See page 56).

25     **Adolphus Reach.**—Pleasant Point (see page 7), on the south side together with Sandhurst, a small village situated in Lennox and Addington County, on the north side, define the northeast limit of Adolphus Reach. This reach is deep with fairly steep-to shores, except as indicated below, and with a more or less bold coast. From Pleasant Point, where it is a little over a mile wide, the reach trends southwestward for a distance of about 5 miles to **Cole Point** on the north 30 side and Bongard on the south side; it then turns gradually westward for a distance of 6 miles to Glen Island on the north side. The western part of Adolphus Reach is somewhat narrower.

35     **Prinyer Cove** is a well sheltered narrow bay, with 4 to 5 fathoms (7<sup>m</sup>3 to 9<sup>m</sup>1) of water in it, situated on the south side of Adolphus Reach, and 1½ miles southwest of Pleasant Point. It contains a wharf, known as Harrison's Wharf, adjacent to a canning factory on the eastern side, at which vessels drawing 13 feet (4<sup>m</sup>0) may land. The entrance to Prinyer Cove is known as **Big Gap**.

40     **Bass Island**, (*Lat. 44° 03' N. Long. 77° 00' W.*) small in extent, lies in a wide open shallow bay fronting Adolphustown on the north side of Adolphus Reach, 8½ miles westward of Pleasant Point. The shoal bank, off the bay, extends one-third of a mile southward of the island. A very shallow ridge connects the island with the main shore.

**Adolphustown** is a small village in the bay behind Bass Island.

45     **Keith Shoal** is the name given to a shallow bank, which extends out 400 yards (365<sup>m</sup>8) from the south shore of Adolphus Reach, south of Bass Island. On it is a least depth of 5 feet (1<sup>m</sup>5).

Charts 2006, 2064.

**Light-buoy.**—A black light-buoy, showing a *flashing green* light, is moored on the northern side of Keith Shoal.

**Pull Point** (*Lat. 44° 03' N. Long. 77° 01' W.*) is the west entrance point of the bay in which Bass Island lies. The distance from Pleasant Point to Pull Point is 10 miles. 5

**Ferry.**—A ferry is operated between **Ferry Point**, about 2 miles south-westward of Adolphustown, and **Glenora** on the opposite shore. The depth at these wharves is about 4 feet (1<sup>m</sup>2).

**Light.**—A light is exhibited, at an elevation of 22 feet (6<sup>m</sup>7), from a 10 lantern on a pole at Glenora wharf.

**Coast.**—From Pull Point westward, the north shore forms a point  $1\frac{1}{2}$  miles long and about half a mile wide. The north side of the point forms the south side of Bass Cove. The narrowest part of Adolphus Reach is at the south extremity of the same point. **Glen Island**, narrow and nearly half a mile in 15 length eastward and westward, lies on the south side of the entrance to Bass Cove, 200 yards (182<sup>m</sup>9) northward of the western part of the point. There is a wharf, with 7 feet (2<sup>m</sup>1) of water alongside, on the southern side of Glen Island. The channel leading to it is not buoyed. The wharf was in ruins in 1956.

**Buoy.**—A red spar buoy marks the edge of the bank extending south- 20 westward from Glen Island.

**Shoal.**—A shallow bank extends out 330 yards (301<sup>m</sup>7) from the south side of Adolphus Reach, southwestward of the south extremity of Glen Island. The apex of this shoal is awash at low water.

**Light-buoy.**—A black light-buoy, showing a *flashing green* light, marks 25 the extremity of the above shoal.

Allison Wharf, in ruins, lies about 1 $\frac{1}{4}$  miles eastward of Bass Island.

**Light.**—A light is exhibited, at an elevation of 39 feet (11<sup>m</sup>9), from a steel tower on Allison Wharf.

Westward of Glen Island, the Bay of Quinte widens out considerably, 30 forming a body of water somewhat triangular in shape; the west end of Adolphus Reach being in the southeast corner, the south end of another reach the continuation of Bay of Quinte extending northward from the apex, and Picton Bay extending southward from the southwest corner of the triangle. Bass and Little Coves are indentations on the eastern side of the same triangle. 35

Except for the shoal described above, following the description of Glen Island, the water is good fairly close to the south of this triangular-shaped body of water; the western side is clean, but the northern part of the eastern side should be given a good berth on account of the shoal water off Little Cove.

**Buoy.**—A red spar buoy is moored in 5 fathoms (9<sup>m</sup>1) at the extremity 40 of the shoal running southwest from Trumppour Point.

Chart 2052.

**Picton Bay** is the southernmost extension of Bay of Quinte. The general trend of Picton Bay is southwestward. It is about 2 $\frac{1}{2}$  miles long and varies in width, from approximately 3,000 feet (914<sup>m</sup>4) at its mouth to 350 feet (106<sup>m</sup>7) 45 at Chimney Point, and 350 feet (106<sup>m</sup>7) at the south end.

## Chart 2052.

**Chimney Point** is situated on the west side, 2,800 feet (853<sup>m</sup>4) northward from the south end of the bay.

**Light.**—A light, privately maintained, is exhibited at Chimney Point.

5 At the middle of the mouth of the bay, the depth is 32 feet (9<sup>m</sup>8). Inward, the depths become gradually less. A winding cut, 300 feet (91<sup>m</sup>4) in width, has been dredged to a least depth of 12 feet (3<sup>m</sup>7), from a point 1,400 feet (426<sup>m</sup>7) northward of Chimney Point wharf to **Buckley Point**, which is situated 1,600 feet (487<sup>m</sup>7) northward of the south end of the bay, on the east side. The 10 whole of the part of the bay southward of Buckley Point has been dredged to a least depth of 12 feet (3<sup>m</sup>7).

Vessels drawing 13 feet (4<sup>m</sup>0) (low water) can lie alongside the wharves at the south extreme of the bay.

15 **Buoys.**—The entrance channel is buoyed, the outer buoy on the east side showing a *flashing white* light and the second buoy on the west side, showing a *flashing red* light.

20 **Wharf.**—The ore wharf of the Marmoraton Mining Company is situated on the west side of Picton Bay, about 1½ miles northward of Chimney Point. The wharf is 250 feet (76<sup>m</sup>2) long, with a least depth of 26 feet (7<sup>m</sup>9) alongside. There are two large pile fenders northeastward of the wharf and two on the southwestern side. There is a conspicuous loading tower on the wharf.

25 **Buoys.**—Two black light-buoys, showing *flashing white* lights, are moored 7.7 cables east-northeastward, and 1.7 cables southward, respectively, of the Marmoraton wharf.

25 A red spar buoy is moored about one cable northeastward of the wharf.

30 **Picton** is the principal town of Prince Edward County. In 1956, it had a population of 4,998. The town is built close to the shore at the south end of the bay of the same name. It is the eastern terminal of a branch of the Canadian National Railways which runs from Trenton, where connection is made with the main lines of the same railway and with that of the Canadian Pacific Railway between Montreal and Toronto.

35 On the eastern side of the harbour, at the upper end, is the wharf of Culliver and Huff Company, with a frontage of 373 feet (113<sup>m</sup>7) and a depth of 12 feet (3<sup>m</sup>7) alongside; this wharf is in a poor state of repair. On the opposite side of the harbour is the Canada Steamship Lines wharf, 180 feet (54<sup>m</sup>9) long, with about 14 feet (4<sup>m</sup>3) of water alongside. The Government wharf, northward of the C.S.L. wharf, has a total frontage of 259 feet (78<sup>m</sup>9), with a depth of 9 feet (2<sup>m</sup>7) alongside. The club house of the Prince Edward Yacht Club stands abreast the lower section of this wharf.

40 **Bass Cove**, about a mile wide and 1½ miles long, extends eastward of Glen Island, which is situated on the south side of the mouth of the cove. As the cove has not been sounded, vessels proceeding in should do so with caution.

## Charts 2006, 2064.

45 **Perch Cove**, immediately northward of Bass Cove, is small and shallow. It is separated from Little Cove by Trumpour Point, and from Bass Cove by Lenid Point.

Charts 2066, 2064.

**Trumpour Point**, (*Lat. 44° 04' N. Long. 77° 04' W.*) narrow and elongated, separates Perch and Little Coves. It is situated a mile northwestward of Glen Island. The shorebank extends out 600 yards (548<sup>m</sup>6) in the direction of the trend of the point. On it, half that distance out, there is a depth of 2 feet (0<sup>m</sup>6). As mentioned before, a red spar buoy marks the extremity of this shorebank.

**Light-buoy**.—A light-buoy, painted with black and white vertical stripes, and showing a *flashing white* light, is moored about 8 cables westward of Trumpour Point.

**Little Cove**, formed by Trumpour Point on the south side and Thompson Point on the north side, is shallow.

**Thompson Point**, as already mentioned, forms the north side of Little Cove. It is situated 1½ miles northwestward of Glen Island. It is the east entrance point of the south end of Long Reach described in the following paragraph.

**Long Reach**.—At Thompson Point, situated 5 miles from Picton, the Bay of Quinte becomes narrow again, forming a reach fairly straight, trending northeastward. Long Reach is from one-third to one-half mile in width for a distance of 5 miles to Green Point, where Bay of Quinte widens out, makes a turn of about 130° westward, and thence becomes narrow again.

**Hay Bay** extends northeasterly from the above-mentioned reach immediately northward of Thompson Point, 7 miles from Deseronto. It is approximately 10 miles long and one-half to 1½ miles wide. The water at the entrance of Hay Bay is of good depth, except for a shoal off the north entrance point (see Casey Point below). Hay Bay has been sparsely sounded.

Situated on the shores of Hay Bay are the villages of **Hayburn**, on the south side, and **Bay Centre**, on the north with ferry connection. **Gosport** is a village on the north shore of Hay Bay 2½ miles inside of Casey Point. In the upper part of the bay, shallow and marshy, are **Clark**, **Charter**, and **White Islands**. **Hare Island**, connected with the north shore, lies between Bay Centre and Hayburn.

**Casey Point**, (*Lat. 44° 06' N. Long. 77° 04' W.*) 6 miles southwesterly of Deseronto, on the east side of the reach, is the north entrance point of Hay Bay. The east side of Casey Point is clean, but southwestward in the direction of Thompson Point, a shallow bank extends out half a mile. On it, half that distance out, there is a depth of 2 feet (0<sup>m</sup>6).

**Buoy**.—A red spar buoy marks the west side of the above shoal off Casey Point. It bears southwesterly distant 1,600 feet (487<sup>m</sup>7) from the southwest extreme of the point. Vessels proceeding into Hay Bay should pass southward of the buoy, at the same time giving it a berth of one-quarter of a mile.

From Thompson Point to **Bogart wharf**, which is situated 3½ miles northward on the east side of Long Reach, at **Watercombe Village**, the water is good but the soundings are irregular.

**Buoy**.—A red spar buoy is moored about a cable north of Bogart wharf on the line from Bogart to Huff wharf and on the west side of **Hogsback Shoal**, that shows at low stages of the lake.

## Charts 2006, 2064.

**Huff wharf** is situated on the east side of the reach on the west extreme of a slight point 2,200 feet (670<sup>m</sup>6) northeastward of Bogart wharf. It is in ruins.

5      **Cole wharf** is situated on the west side of the reach almost straight across from Huff wharf, 3½ miles from Deseronto. The wharf is in ruins.

**Ferry.**—A ferry service is maintained between Huff and Cole wharves.

10     **Catalaque Shoal** is a shallow bank, extending out 1,200 feet (365<sup>m</sup>8) from the west side of Long Reach, three-quarters of a mile northward of Cole wharf, or two-thirds of a mile southward of Green Point, which is situated 1½ miles from Deseronto. On it, 600 feet (182<sup>m</sup>9) out, there is a depth of one foot (0<sup>m</sup>3).

15     From Thompson Point to Green Point, there are several villages situated on the west shore of Long Reach, **Roblin Mills**, opposite to Casey Point, **Mount Carmel** across from Watercombe and Bogart wharf, and **Green Point** just north of Cole wharf.

20     **Light-buoy.**—A black light-buoy, showing a *flashing white* light, marks the east extreme of Catalaque Shoal. Vessels should pass close to this buoy on account of three shoal spots each lying 1,200 feet (365<sup>m</sup>8) off the opposite shore. These three spots are in line, the northernmost lies just abreast of the spar buoy, and the southernmost lies 2,300 feet (701<sup>m</sup>0) southward of it.

**Carman Shoal** is a shoal spot, which extends in a southwesterly direction from the east shore of the reach, one-third of a mile northeastward of Catalaque Shoal. It has 15 feet (4<sup>m</sup>6) of water on its southwest end.

25     **Buoy.**—A red spar buoy marks the southwest end of Carman Shoal. It bears 150° and is distant half a mile from Green Point.

**Green Point** (*Lat. 44° 10' N. Long. 77° 05' W.*) is situated 1½ miles southward of Deseronto. It is the west point of the north end of the reach described in the foregoing paragraphs.

30     Northward of Green Point, the Bay of Quinte widens out forming an irregular body of water with Deseronto on its northwest side, the entrance of Napanee River on its northeast side, Foresters Island in its western part, and the continuation of Bay of Quinte westward in the northwest corner.

35     **Grassy Point** is the northeastern point of Prince Edward County; it is situated half a mile northwestward of Green Point. There are several cribs and log booms between these two points.

40     **Foresters Island**, nearly circular in shape, about one-quarter of a mile in diameter, is situated southwestward of Deseronto, 2,500 feet (662<sup>m</sup>0) from the western end of the westernmost wharf. A ridge, which at low water becomes almost dry, connects the island with Grassy Point, 2,500 feet (662<sup>m</sup>0) southwestward.

**Buoy.**—A black spar buoy is moored at the 3-fathom (5<sup>m</sup>5) line, southeast of Foresters Island.

45     **Light-buoy.**—A black light-buoy, showing a *flashing white* light, is moored in 25 feet (7<sup>m</sup>6) of water on the western side of the turning point of the channel opposite Deseronto. It bears 064°, distant about 3 cables, from the north extremity of the island.

Charts 2006, 2064.

**Deseronto**, a town in Hastings County, is situated on the north side of the most northerly part of Bay of Quinte, 13 miles northeastward of Picton and 17 miles eastward of Belleville. It was once one of the principal commercial and lumber ports on the north shore of Lake Ontario between Kingston and Toronto. The most conspicuous marks in the town are the Presbyterian church steeple, the water standpipe, and the post office clock dial, which is illuminated at night. A spur, about  $2\frac{1}{2}$  miles in length, connects the town with the main line of the Canadian National Railways between Montreal and Toronto. There were 1,729 inhabitants in 1956.

**Wharf.**—A Government wharf, 230 feet (70<sup>m</sup>1) long and 96 feet (29<sup>m</sup>3) wide, is situated at the foot of Mill Street. There is 9 feet (2<sup>m</sup>7) of water in front of the wharf and the slips on each side have been dredged to  $8\frac{1}{2}$  feet (2<sup>m</sup>6).

**Napanee River** entrance is situated less than a mile eastward of Deseronto. The river is narrow and winding through low and marshy land. A channel, 15 75 feet (22<sup>m</sup>9) in width, has been dredged as far up as the town of Napanee, which is situated  $5\frac{1}{2}$  miles northeastward from the entrance of the river. The channel is marked by spar buoys but no lights are maintained. It is reported that a 6-foot (1<sup>m</sup>8) draught is available.

**Unger Island** (*Lat. 44° 12' N. Long. 77° 02' W.*) lies on the northern side 20 of the river mouth, connected to the mainland by marshy land.

Vessels, other than small craft, should not attempt to proceed up the river without a pilot, except with local knowledge.

**Napanee** is a town of considerable size and importance and a railway division point. It had a population of 4,273, in 1956. There are four wharves, 25 the largest that of the Napanee Fuel Supply Company, with a berthing length of 200 feet (61<sup>m</sup>0) and a depth alongside of 10 feet (3<sup>m</sup>0).

**Directions from Pleasant Point to Deseronto and Napanee.**—A vessel proceeding westward of Pleasant Point can keep to the middle of Adolphus Reach with safety. When abreast of Glen Island, 12 miles from Pleasant Point, 30 steer 304° until Thompson Point bears 011°, or until the next reach opens up in a northeasterly direction, thence steer about 011° for the middle of its entrance. Keep in the middle of the reach, passing close to Catalaque Shoal black spar buoy, leaving it on the port side. Pass fairly close to Carman Shoal red spar buoy and then steer 018°, until the northern side of Foresters Island 35 is abeam.

If bound for Deseronto, steer northward for the Government wharf where there is the greatest depth. If bound for Napanee, steer northwestward for the entrance of the river.

If westward bound, alter the course sharply westward, passing northward 40 of the light-buoy, and when passing northward of Foresters Island keep the main shore a little closer aboard.

For a distance of  $7\frac{1}{2}$  miles westward of Deseronto, the Bay of Quinte should be navigated with great caution, because the channel is irregular and narrow, and has several ugly rocky shoals.

From Foresters Island westward, the deep water is nearly midway between the two shores to a point on the south shore, situated  $1\frac{1}{2}$  miles from Foresters Island. From this point to Telegraph Narrows, the deep water is close to the south shore.

Charts 2006, 2064.

**Buoy.**—A red spar buoy is moored to the north side of the channel, at the 3-fathom (5<sup>m</sup>5) line, and one-half mile west of Foresters Island.

5 **Light.**—A light is exhibited, at an elevation of 80 feet (24<sup>m</sup>4), from the steeple of a church about a mile westward of Deseronto. It is known as Mohawk Church light.

**Ferry.**—About three-quarters of a mile southwestward of Mohawk Church is the **Ferry Wharf**, from which a ferry runs to **Peterson Wharf** on the south shore of the narrows.

10 **Buoy.**—A black spar buoy is moored, close offshore, about 4 cables west-southwestward of Peterson Wharf.

**Telegraph Island** lies close of the south shore at the narrowest point of the narrows, about 3½ miles westward of Foresters Island.

15 **Light.**—A light is exhibited, at an elevation of 46 feet (14<sup>m</sup>0), from a white, square tower on the north side of Telegraph Island.

**Telegraph Narrows** is the name given to the dredged channel northward of and close to Telegraph Island. The channel is buoyed and there is reported to be a depth of 11 feet (3<sup>m</sup>4) in the channel.

20 **Light-buoys.**—The western buoy on the south side of the channel is a black light-buoy, showing a *flashing green* light. About 1½ cables northeastward of the black light-buoy, and on the north side of the channel, is a red light-buoy, showing a *flashing red* light.

25 **Light.**—A light is exhibited, at an elevation of 25 feet (7<sup>m</sup>6), from a mast with a diamond-shaped daymark, situated on the southern shore of Telegraph Narrows, about 7 cables eastward of Telegraph Island light.

Chart 2007.

30 **Coast.—Buoy.**—From the western end of Telegraph Narrows, the deeper water lies close to the south shore, until abreast a red spar buoy, which is moored about 7½ cables westward of Telegraph Island light. It marks a shoal bank, which extends 3 cables southward from the north shore. From this position, the deeper water trends towards the north shore and passes north of Northport Shoal.

35 **Northport Shoal** lies a little southward of midway between the two shores, 3¾ miles westward of Telegraph Island lighthouse. There is a least depth of 2 feet (0<sup>m</sup>6) on the shoal.

**Buoys.**—The north side of Northport Shoal is marked by a black light-buoy, showing a *flashing white* light, and, close eastward of the light-buoy, a black spar buoy.

40 A red spar buoy marks the southeastern edge of the 2-foot (0<sup>m</sup>6) spot. Vessels should not pass close southward of the latter buoy, and, if using this channel, should favour the south shore.

A black spar buoy marks the south side of the channel about one mile eastward of Northport Shoal light-buoy.

45 **Northport Village** is located on the south shore, 3½ miles west of Telegraph Island, at the mouth of a narrow, marshy, shallow bay or slough. Although there is no through passage by this slough, except perhaps at extreme high

## Chart 2007.

water levels of Lake Ontario, it forms with Muscote Bay at the west end what is known as Big Island. The berth on the west side of Sanderson's wharf, 100 feet (30<sup>m</sup>5) long and 30 feet (9<sup>m</sup>1) wide was dredged, in 1941, to a depth of 12½ feet (3<sup>m</sup>9).

**Trident Point.** (*Lat. 44° 10' N. Long. 77° 13' W.*), the north point of the east end of Big Bay, is situated about halfway between Deseronto and Belleville. A shallow spit extends out from this point, half a mile southwesterly.

**Buoys.**—A red spar buoy marks the southwest extreme of an 8-foot (2<sup>m</sup>4) patch detached from the shallow spit running out from Trident Point.

A black light-buoy, showing a *flashing white* light, is moored about 6½ cables, 207°, from Trident Point, and a red spar buoy is moored 5 cables, 140° from the same point.

**Big Bay.**—Westward of Trident Point, the Bay of Quinte widens out to form Big Bay. The northern shore of **Big Island**, which is 5 miles long north-eastward and southwestward, is situated along the southeast side of Big Bay. A shallow bank extends out 300 yards (274<sup>m</sup>3) from the northwest shore of Big Island, 2 miles southwest of the northeast point of the island. Another shallow bank extends out 500 yards (457<sup>m</sup>2) from the same shore, two-thirds of a mile farther southwestward of the latter bank. The northeast point of Big Island is situated just south of Northport Shoal.

**Big Island Shoal**, half a mile long and narrow, and with 3 feet (0<sup>m</sup>9) of water on it, lies half a mile off Big Island, 4 miles from the northeast point of the island.

Big Island wharf, on the south side of Big Bay, extends out 50 feet (15<sup>m</sup>2) to 7 feet (2<sup>m</sup>1) of water.

**Muscote Bay** is situated southwestward of Big Island Shoal and to the westward of Big Island, and has been sparsely sounded. It contains several islands, the most extensive one being **Huff Island**, connected to the mainland by marshy ground.

At the head of Muscote Bay are **Goose** and **Fox Islands**, and near the west side of Big Bay and between the northern end of Huff Island and Massasauga Point are **Sawguin**, **Grape**, **Grove**, and **Ship Islands**, mostly low, marshy and wooded.

**Hungry Bay.**—The northeastern part of Big Bay is named Hungry Bay. The latter has shallow banks extending out as much as two-thirds of a mile. **Salmon Island**, low and marshy, is situated on its northwest side near the entrance of **Salmon River**, a shallow and narrow stream of water which runs through **Shannonville**, 1½ miles northeastward.

The plant of the Canada Cement Works is situated on the northwestern side of Big Bay. The wharf is 430 feet (131<sup>m</sup>1) long, with a reported depth of 12 feet (3<sup>m</sup>7) at the outer end.

**Buoys.**—A red spar buoy, moored in 15 feet (4<sup>m</sup>6) of water, marks the edge of the shoal bank about 900 feet (274<sup>m</sup>3) eastward of the wharf. Another red spar buoy lies about 3 cables, 180° from the outer end of the wharf.

Westward of Big Bay, the Bay of Quinte becomes narrow for a distance of about one mile and then widens again, forming another bay 3 miles in length and one mile in width, at the west end of which, on the north side, Belleville is situated.

*Chart 2007.*

**Point Anne** separates the above bay from Big Bay. The Canada Cement plant was formerly situated on the southeastern part of this point, where the wharves and buildings are now abandoned.

5      **Minnie Blakely Shoal**, with 2 feet (0<sup>m</sup>6) over it, lies 330 yards (301<sup>m</sup>7) southward of the above point.

**Light-buoy.**—A *flashing red* light-buoy marks the south extremity of Minnie Blakely Shoal.

10     **Buoys.**—Two black spar buoys mark the south side of the channel, southward and eastward of Minnie Blakely Shoal light-buoy.

**Horse Point**, narrow and elongated, is situated south across from the eastern part of Point Anne. It is the southeast entrance point of the narrow part of Bay of Quinte which separates Big Bay from the bay westward.

**Ship Islet** is situated one-quarter of a mile northeast of Horse Point.

15     **Massasauga Point** (*Lat. 44° 09' N. Long. 77° 19' W.*) is the most northerly point on the south side of the narrow part of Bay of Quinte which separates Big Bay from the bay westward of it. It bears nearly east and is distant about three miles from the Government wharf at Belleville.

20     There are some cottages and old hotel buildings showing prominently on the point.

**Shoal.—Buoy.**—A black light-buoy, showing a *flashing green* light, marks the north side of a 2-foot (0<sup>m</sup>6) spot known as **Rush Bar**, lying 250 yards (228<sup>m</sup>6) off, half a mile westward of Massasauga Point.

25     In the open bight, just west of Massasauga Point, are some marshy islets the largest being **Cedar Island**, west of which is **Wallbridge Point**.

**Cow Island** lies opposite Belleville, 2 $\frac{1}{4}$  miles westward of Massasauga Point, and well towards the middle of the bay. Southward of this island, the bay is shallow.

30     **Snake Island** lies westward, and is distant half a mile, from Ox Point, the southwestern part of Point Anne. It is fairly deep close to the south side of the islet. Northward of it the bay is mainly shallow.

*Chart 2069.*

35     **Belleville**, in Hastings County, is situated on the north shore of Bay of Quinte, at the mouth of Moira River, 9 miles eastward of Trenton and 14 $\frac{3}{4}$  miles westward of Deseronto. The city, which in 1956 had a population of 20,605, is the most important commercial and industrial point on Bay of Quinte. It is a station on the main line of the Canadian Pacific Railway and on that of the Canadian National Railways between Montreal and Toronto.

40     It has several church steeples and tall chimneys, which show conspicuously. The city hall tower, with its clock dial, also shows up conspicuously.

The southern edge of the shallow bank at the mouth of Moira River is marked with a red spar buoy. The channel into Belleville is buoyed.

45     **Wharves.**—The outermost wharf in the harbour is the Government wharf, 635 feet (193<sup>m</sup>6) in length, with an "L" end extending easterly 170 feet (51<sup>m</sup>8). Northward of the "L", the City or Harbour Commission wharf extends eastward 615 feet (187<sup>m</sup>5) from the Government wharf. The basin between the

## Chart 2069.

"L" end and the City wharf had a least depth of 9 feet ( $2^m7$ ) in 1955. There is a least depth of 11 feet ( $3^m4$ ) in the entrance channel to the Government wharf.

The entrance channel to the wharf had a least depth of 11 feet ( $3^m3$ ) in 1955. There are railway tracks on the wharf. To the north of the Government wharf is the Schuster dock 575 feet ( $175^m3$ ) long with a depth of 10 feet ( $3^m0$ ), alongside. A channel, with a depth of 9 feet ( $2^m7$ ), leads to this dock. Northward of the latter are the wharves of Imperial Oil Company and the Quinte Sea Cadets Dock. In the northwestern part of the harbour is the Murch Marine Dock, 265 feet ( $80^m8$ ) long, with a depth alongside of 9 feet ( $2^m7$ ) at the outer end and dry at the inner end.

**Buoys.**—A black spar buoy and a red light-buoy, showing a *flashing red* light, moored 150 feet ( $45^m7$ ) apart, 2 cables southward of the Government wharf, mark the southern end of the entrance channel. The easterly side of the dredged area, which extends 200 feet ( $61^m0$ ) eastward and approximately 500 feet ( $152^m4$ ) southward from the outer end of the Government wharf, is marked by two red spar buoys. A black spar buoy, one cable southward from the same wharf, marks the turn in the cut leading to Schuster and Murch Marine wharves. Two black spar buoys mark the cut leading to the Schuster 20 wharf. The channel to the Murch Marine wharf is marked by additional buoys.

**Light.**—A light is exhibited, at an elevation of 36 feet ( $11^m0$ ), from a red, square lantern, on the roof of the Government warehouse on the end of the wharf.

**Zwick Island** (*Lat.  $44^{\circ} 09' N.$  Long.  $77^{\circ} 23' W.$* ) is a small, low, swampy 25 portion of land just west of the Belleville end of the bridge and joined to the shore by reclaimed land.

**Bay of Quinte bridge**, across from Belleville to **Rossmore**, a small village on the south side, has a draw span near the latter place. The centre of the draw is 195 feet ( $59^m4$ ) from the south shore, with channels 73 and 30 70 feet ( $22^m3$  and  $21^m3$ ) in width on the north and south sides, respectively, having 14 feet ( $4^m3$ ) of water available.

**Lights.**—A *fixed white* light is shown on the south side of the southern opening and another *fixed white* light on the northern side of the north opening. Two *fixed green* lights are also shown from each end of the draw when it is open. A vessel approaching from eastward, or from westward, will see, when the bridge is open, one *white* light on the left, two *green* lights in the middle and one *white* light on the right side. Pass between a *white* and a *green* light as desired. A *red* light showing instead of the *green* lights means that the bridge is closed and that 35 vessels cannot pass.

**Cable.**—Immediately west of the Bay of Quinte bridge (*Lat.  $44^{\circ} 09' N.$  Long.  $77^{\circ} 23' W.$* ), two cables cross the channel, in 20 feet ( $6^m1$ ) of water.

**Directions from Deseronto to Belleville.**—From the wharves at Deseronto, steer to pass Foresters Island with the north shore of Bay of Quinte a little closer aboard, then proceed in mid-channel until abreast of the two points, one on each side, each with a wharf,  $1\frac{1}{2}$  miles southwestward of the east side of Foresters Island. The vessel should then be 300 yards ( $274^m3$ ) from both shores. From here follow the south shore, at the same time diminishing the distance from it to 250 yards ( $228^m6$ ) in about one mile, or, in the daytime, until the buoys marking the south side of Telegraph Narrows channel are brought in 50

## Chart 2069.

line, or night until Northport Shoal light-buoy is brought in line with Telegraph Island light, bearing  $256^{\circ}$ , thus avoiding a 12-foot ( $3^{\text{m}}7$ ) spot situated three-quarters of a mile from the light and bearing  $072^{\circ}$  from it. Then alter the course 5 northward for the buoys channel, the axis of which bears about  $077^{\circ}$  and is only 225 feet ( $68^{\text{m}}6$ ) northward of the lighthouse, and pass close south of a red light-buoy about half a mile eastward of the light. Immediately after coming out of the buoys channel, steer about  $237^{\circ}$  to keep the same distance from the south shore and to pass midway between it and the red spar buoy, 10 two-thirds of a mile distant. When abreast of the latter buoy, haul slowly northward on Northport Shoal light-buoy which should bear about  $262^{\circ}$  and be  $2\frac{1}{2}$  miles distant. Having done this, alter the course to  $267^{\circ}$  and keep that course, passing north of a black spar buoy,  $1\frac{1}{2}$  miles east of the light, until abreast of the light-buoy, passing 300 yards ( $274^{\text{m}}3$ ) northward of it.

15 From the latter position, steer  $247^{\circ}$  for a distance of three-quarters of a mile passing close southward of the red spar buoy southeastward of Trident Point. Thence steer  $272^{\circ}$  for  $4\frac{1}{2}$  miles, with Minnie Blakely Shoal light-buoy ahead. When near the light-buoy, alter the course to pass close south of it. Then bring it immediately over the stern and steer with Belleville light ahead, 20 bearing about  $272^{\circ}$ , for a distance of 3 miles or until nearly abreast of Cow Island, and then proceed as desired.

25 From the latter position the light-buoy and spar buoys outside of Belleville Harbour, two-thirds of a mile distant, should be seen over the port bow. If bound for Belleville alter the course sufficiently southward so that the vessel has ample space to make a turn northward and proceed for Belleville Harbour.

If bound westward steer  $253^{\circ}$  for the swing span of Bay of Quinte bridge close to the south shore,  $1\frac{1}{4}$  miles distant.

**Coast.**—From Bay of Quinte bridge to Nigger Narrows, a distance of 5 miles southwestward, Bay of Quinte varies in width from a little more than 30 half a mile to a little more than three-quarters of a mile and has depths of 14 to 16 feet ( $4^{\text{m}}3$  to  $4^{\text{m}}9$ ).

Prominent school buildings stand close to the shore just west of Belleville. There is a boat landing here.

35 **Anderson Shoal**, with 3 feet ( $0^{\text{m}}9$ ) of water over it, lies two-thirds of a mile northward of **Anderson Wharf**, which is situated on the south side,  $2\frac{1}{2}$  miles southwestward of Bay of Quinte drawbridge. A black spar buoy marks the northern side of the shoal.

40 **Rednersville Wharf** lies  $3\frac{3}{4}$  miles southwestward of Belleville bridge. The wharf has a depth of 10 feet ( $3^{\text{m}}0$ ). Two shoals lie about 2 cables off the wharf. One with a depth of 10 feet ( $3^{\text{m}}0$ ) lies northward, and the other, with a depth of 11 feet ( $3^{\text{m}}4$ ), lies northwestward of the wharf. The shoals are not buoyed.

45 **Nigger Island**, (*Lat.  $44^{\circ} 07' N.$ , Long.  $77^{\circ} 30' W.$* ), 800 feet ( $243^{\text{m}}8$ ) in length northeasterly and southwesterly and 350 feet ( $106^{\text{m}}7$ ) in width, lies closer to the northern shore, 6 miles westward of Bay of Quinte bridge, Belleville, and 4 miles eastward of Trenton. A shallow bank extends in a southwesterly direction almost fully across from the island to **Potter Point** of the southern shore, leaving a narrow channel described below, under the heading of Nigger Narrows. A bank, with a greatest depth of 8 feet ( $2^{\text{m}}4$ ) connects the island 45 with the northern shore of the bay. The winding channel northward of Nigger Island should not be attempted by other than small craft, which should pass fairly close to the northern end of the island.

## Chart 2069.

**Light.**—A light is exhibited, at an elevation of 27 feet (8<sup>m</sup>2), from a pole on a pier, situated about 3 cables southwestward of Nigger Island.

**Nigger Narrows.**—The buoied channel between Nigger Island lighthouse and Potter Point has a least width of 350 feet (106<sup>m</sup>7). Its least depth is 12 feet (3<sup>m</sup>7). The distance from the lighthouse to Potter Point is 300 yards (274<sup>m</sup>3).

**Buoys.**—In addition to the lighthouse, which is situated 15 yards (13<sup>m</sup>7) northwest of the northwest side of the channel, the channel is marked by four buoys.

A red spar buoy, marking the northwestern side of the channel, is moored in 10 feet (3<sup>m</sup>0) of water, 350 yards (320<sup>m</sup>0) northeastward of the lighthouse.

The southern side of the channel is marked by two black spar buoys and a black light-buoy. The latter, showing a *flashing green* light, is moored on the edge of the shallow bank which extends from the shore westward of Potter Point, bearing 229° and distant 1,600 feet (487<sup>m</sup>7) from Nigger Island lighthouse; a black spar buoy is moored on the edge of the shallow bank, which extends from the shore eastward of Potter Point, bearing 073° and distant 700 yards (640<sup>m</sup>1) from the same lighthouse; the second black spar buoy is placed almost opposite the light, on the south side of the channel, about 160 yards (146<sup>m</sup>3) from the extremity of Potter Point.

**Coast.**—The greater part of Bay of Quinte southwestward of Nigger Narrows is shallow. It has two dredged cuts leading to Trenton, one from eastward and the other northward from the eastern end of Murray Canal. From the narrows to Murray Canal, the channel is along the southern side of the bay.

**Way Point** is situated on the southern side of Bay of Quinte, three-quarters of a mile southwest of Nigger Island lighthouse. A shallow spit extends one-third of a mile westward from the point.

**Buoy.**—A black spar buoy lies at the northwest extremity of the spit off Way Point.

**Myers Point** lies across from Way Point and off it, close to the north side of the eastern buoied channel to Trenton, is **Baker Island**.

A shoal, small in extent, with 10 feet (3<sup>m</sup>0) over it, lies half a mile southwestward of Way Point.

The northern edge of both the above shoal and the spit extending from Way Point are on the line of Nigger Island lighthouse to Onderdonk Point, 1.0 and 1.5 miles, respectively, from the former. Vessels should keep well northward of this line.

**Onderdonk Point** (*Lat. 44° 05' N. Long. 77° 32' W.*) is situated on the southern shore across from Trenton, or 2<sup>1</sup>/<sub>2</sub> miles southwestward of Nigger Island lighthouse. **Indian Island Bank**, which extends eastward from Indian Island, leaves between it and the shore at Onderdonk Point a channel only 500 feet (152<sup>m</sup>4) in width. Westward of the point, the channel becomes gradually wider. For buoy off Onderdonk Point see paragraph following description of Indian Island.

**Indian Island**, 400 yards (365<sup>m</sup>8) in length northward and southward and 235 yards (214<sup>m</sup>9) in width, is situated a little less than a mile northeast of Murray Canal east entrance, and nearly 1.7 miles west of Onderdonk Point.

## Chart 2069.

Off Onderdonk Point, the channel between the east end of the bank and the shore is only 500 feet (152<sup>m</sup>4) wide. On this bank, half a mile northeastward of Indian Island, there is a depth of one foot (0<sup>m</sup>3). On the eastern end of the 5 bank there is a depth of 5 feet (1<sup>m</sup>5).

**Buoys.**—A light-buoy, showing a *flashing red* light, moored northwestward of Onderdonk Point marks the southeast side of the eastern extreme of Indian Island Bank described above.

A red spar buoy is moored in 11 feet (3<sup>m</sup>4) of water, one-third of a mile 10 south of the one-foot (0<sup>m</sup>3) spot on Indian Island Bank. Another red spar buoy, moored on the east side of a 9-foot (2<sup>m</sup>7) spot, bears 355°, distant 2,000 feet (609<sup>m</sup>6) from Onderdonk Point.

A shoal, marked by a red spar buoy, small in extent with 7 feet (2<sup>m</sup>1) least water on it, lies northward, distant half a mile from Onderdonk Point.

15 **Murray Canal**, in the southeast corner of Northumberland County, connects Bay of Quinte with Presqu'ile Bay. Its eastern end is at **Twelve O'Clock** Point, the southwest extreme of Bay of Quinte. The canal is straight, bears 247° and has no locks. It is 5 miles long from pierhead to pierhead or about 20 7½ miles including the cuts beyond the pierheads at each end. Between the banks of the canal, the width is 124 feet (37<sup>m</sup>8), but the bottom of the cut is only 80 feet (24<sup>m</sup>4) wide. It has a least depth of 8½ feet (2<sup>m</sup>6) at the Standard low water datum adopted by Canada which is 243 feet (74<sup>m</sup>1) above mean tide New York, N.Y. (This datum is nearly extreme low water; the average mean summer level of Lake Ontario is usually one to 3 feet (0<sup>m</sup>9) above this.) (See 25 page xxv).

Channels 200 feet (61<sup>m</sup>0) wide have been dredged, from deep water in the Bay of Quinte and Presqu'ile Bay, to the piers which define and protect the ends of the canal. Vessels are restricted to 4 miles per hour when passing through.

30 **Bridges.**—There are two highway swing bridges and one railway swing bridge crossing the canal, all of which are passed to the south of the swings which are somewhat to the northward of the axis of the canal. They are Carrying Place Bridge, 0.8 mile; Canadian National Railways bridge, 1.03 miles; and Lovatt bridge, 4.2 miles from the lighthouse on the pierhead at the east 35 end of the canal. They open on signals from vessels. The distance between the lighthouses at each end is 5.15 miles.

Smithfield bridge, 2.4 miles from the east end of the canal, has been removed, but the sub-structure remains.

The minimum overhead clearance in the canal is 125 feet (38<sup>m</sup>1), at the 40 crossing of a power line.

**Lights.—Buoy.**—A light is exhibited, at an elevation of 27 feet (8<sup>m</sup>2), from a white, circular column rising from a hexagonal base, on the outer end of the north pier at the eastern entrance to Murray Canal.

45 From the middle of the above canal swing bridges is shown a *fixed red* light, when the bridge is closed, and a *fixed white* light, when the bridge is open.

A red spar buoy is moored about 3½ cables eastward of the light on the northern pier. It marks the northern edge of the channel.

50 **Trenton**, a town in Hastings County, is situated 10 miles westward of Belleville, on the northern shore of Bay of Quinte, at the mouth of **Trent River**, about 2 miles from the western extremity of the bay. In 1956, it had a population of 11,492. It is a station on the main lines of the Canadian Pacific and the

## Chart 2069.

Canadian National Railways between Montreal and Toronto. A branch line of the latter, running between Maynooth, Howland, and Picton, passes through Trenton. Near its mouth, the Trent River is crossed by a highway bridge with a swing span (the farthest bridge down stream); the Canadian National Railways bridge (also with swing span) 0.27 mile above the latter, and the Canadian Pacific Railway bridge, stationary, with 46 feet ( $14^{\text{m}}0$ ) clearance above low water, 0.7 mile above the highway bridge across the Trent River.

Another Canadian National Railways bridge crosses the river at Trenton Junction, 1.55 miles above the highway bridge at the mouth of the river, or 10 immediately below the first lock of the Trent-Severn Waterway. It is a stationary bridge having a clearance of 33 feet ( $10^{\text{m}}1$ ) above low water.

**Wharves.**—The Government wharf (Pollys), with 219 feet ( $66^{\text{m}}8$ ) frontage along the western side of the Trent River, is situated immediately southward of the highway bridge. Ten feet ( $3^{\text{m}}0$ ) may be carried to this wharf, 15 which has a shelter on it. The southeastern face of the wharf is 136 feet ( $41^{\text{m}}5$ ) in length. Gasoline may be obtained here. At right angles to this wharf is a wall alongside which vessels may moor; the depth alongside is 8 feet ( $2^{\text{m}}4$ ). A cold storage plant is situated on a wharf southward of the basin.

Powers Coal Co. wharf, with 530 feet ( $161^{\text{m}}5$ ) frontage along the eastern 20 side of the river, is situated immediately southward of the highway bridge; 10 feet ( $3^{\text{m}}0$ ) may be carried to the wharf. On the east side of the harbour, just above the highway bridge, is the wharf of the Central Bridge Company, 320 feet ( $97^{\text{m}}5$ ) in length and with a depth of  $8\frac{1}{2}$  feet ( $2^{\text{m}}6$ ) alongside.

**Channel.**—Trenton (*Lat.  $44^{\circ} 06' N.$  Long.  $77^{\circ} 35' W.$* ) is reached through 25 a cut which has been dredged out of the shallow flats extending nearly across Bay of Quinte in that locality.

**Buoy.**—A shoal, with a depth of  $9\frac{1}{2}$  feet ( $2^{\text{m}}9$ ) and marked by a red conical buoy, lies just at the east entrance of the dredged cut into Trenton.

**Eastern Channel.—Buoys.**—The eastern crooked cut, 150 feet ( $45^{\text{m}}7$ ), 30 in width, about  $2\frac{1}{2}$  miles in length and dredged to a least depth of 10 feet ( $3^{\text{m}}0$ ), runs 180 yards ( $164^{\text{m}}6$ ) south of Baker Island, which is situated 400 yards ( $365^{\text{m}}8$ ) south of Myer Point, about 2 miles east of Trenton. The eastern end of the dredged cut bears  $235^{\circ}$  and is distant one mile from Nigger Island light-house. The eastern part of the cut, 2,500 feet ( $762^{\text{m}}0$ ) long and bearing  $262^{\circ}$ , 35 is marked by two red spar buoys on the northern side and a black light-buoy, showing a *flashing white* light, on the southern side at the turn. Between this turn and the next, 5,000 feet ( $1,524^{\text{m}}0$ ) and bearing  $249^{\circ}$ , there are three red spar buoys on the northern side, and a red light-buoy No. 110T, showing a *flashing red* light, on the northern side of the turn, and a black spar buoy on the southern side of the turn, opposite the light-buoy. 40

The next part of the cut, 3,105 feet ( $919^{\text{m}}0$ ) in length and bearing  $281^{\circ}$ , is marked by two red spar buoys on the northern side and a black spar buoy on the southern side.

From here, the channel bears  $293^{\circ}$  for a distance of 1,400 feet ( $426^{\text{m}}7$ ), and 45 thence  $313^{\circ}$ , 2,900 feet ( $883^{\text{m}}9$ ) to abreast the Government wharf, on the western side of the harbour, immediately below the bridge. Two red spar buoys and a red light-buoy, showing a *flashing red* light, and one black spar buoy mark this section of the channel.

## Chart 2069.

**Leading lights.**—The front light is shown from in front of a white diamond-shaped daymark, at a height of 20 feet, (6<sup>m</sup>1). The rear light is shown in a similar way, at a height of 42 feet (12<sup>m</sup>8). The rear light bears 281°, and 5 is distant 520 feet (158<sup>m</sup>5) from the front light.

The lights in line, bearing 281°, lead in from the eastward, through part of the dredged channel, for a distance of 3,012 feet (918<sup>m</sup>1).

**Directions from Belleville to Trenton and to Murray Canal.**—From Bay of Quinte bridge, steer 246° with Nigger Island lighthouse ahead. Keep 10 this course for a distance of 5<sup>3</sup>/<sub>4</sub> miles, when the vessel should be about half a mile eastward of Nigger Island, and should have the black spar buoy off the northeast side of Potter Point abreast the port bow. Haul a little northward to give a slightly wider berth to that buoy, then steer through the buoys channel, with the black spar buoy at the western end of the channel over the 15 port bow, to pass not more than 250 feet (76<sup>m</sup>2) southeastward of Nigger Island lighthouse. When 200 yards (182<sup>m</sup>9) past the lighthouse, haul northward, and then steer 252° until abreast of the black light-buoy off the west side of Potter Point, on the southern side of the channel, to keep away from the shallow water extending from the northwest side of the point. If bound for Murray 20 Canal steer 223° with Onderdonk Point, 2<sup>1</sup>/<sub>2</sub> miles distant, slightly over the port bow and Nigger Island lighthouse over the port quarter. Pass midway between Onderdonk Point and the red light-buoy off it, thence steer 237° for the red spar buoy marking the northern side of the eastern end of the dredged channel leading into the canal, 2 miles distant.

25 If bound for Trenton from the position at the west end of Nigger Narrows, steer about 236° for the east end of the buoys channel, about two-thirds of a mile distant, leading into the Trent River and proceed through the channel, which, although crooked, is well buoyed. Having passed the last red spar buoy, which is moored close to and south of Gilmour wharves, proceed northward along the east side of the mouth of the river until close to the highway 30 bridge.

## Chart 2010.

**Trent-Severn Waterway.**—The term “Trent-Severn Waterway” is applied to a series of navigable rivers and lakes connected by short canals forming a 35 continuous system with about 6-foot (1<sup>m</sup>8) navigation for 224 miles from the Bay of Quinte, Lake Ontario, to Swift Rapids on the Severn River, and from the latter point, for vessels of smaller sizes which can be passed over the marine railways, for a further distance of 16 miles to the outlet into Georgian Bay at Port Severn. Of the 240-mile route only 33<sup>1</sup>/<sub>4</sub> miles are artificial canal prism.

## 40 Charts 2010, 2011, 2012, 2013, 2014.

The total rise, or lockage from Lake Ontario to the summit level, Balsam Lake, is 595 feet (181<sup>m</sup>4), which is overcome by thirty-five locks. From Balsam Lake to Georgian Bay there is a fall of 260 feet (79<sup>m</sup>2), overcome by eight locks and two marine railways. On the Seugog branch there is one lock having a lift 45 of 7 feet (2<sup>m</sup>1). The total rise, or lockage, on the canal system is therefore 862 feet (262<sup>m</sup>7).

Leaving Lake Ontario at Trenton on the Bay of Quinte, the route of the canal follows the course of the Trent River to Rice Lake. Passing through Rice Lake, the route then follows the Otonabee River, past Peterborough, to Lake-50 field where it enters the Kawartha chain of lakes. Thence it passes in succession

Charts 2010, 2011, 2012, 2013, 2014.

through Katchawano, Clear, Stony, Lovesick, Deer Bay, Buckhorn, Pigeon, Sturgeon, and Cameron Lakes to Balsam Lake, the summit level. From Balsam Lake an artificial rock cutting two miles in length gives connection with the raised waters of the Grass River and Mitchell Lake. Another rock cutting,  $3\frac{1}{2}$  miles in length, carries navigation into the raised waters of the Talbot River. The Talbot River is canalized for a distance of 8 miles, from which point a canal carries navigation for  $3\frac{1}{2}$  miles to Lake Simcoe. Passing through Lakes Simcoe and Couchiching, the route then follows the Severn River, including Sparrow Lake to Gloucester Pool and Little Lake, terminating at Port Severn 10 where a small lock gives outlet into Georgian Bay.

The **Scugog Branch** embraces 8 miles of river navigation to Lindsay, where a dam and lock of 7 feet ( $2^m1$ ) lift give navigation through 10 miles of river to Lake Scugog.

A bridge spans the river at Lindsay and has a vertical clearance of 13 feet 15 ( $4^m0$ ).

Water supply to maintain the summit level, the Kawartha Lakes, and stream flow into the Otonabee and Trent Rivers for power development, is obtained from a reservoir system embracing sixty-one lakes to the north of the Kawartha chain of lakes.

The size of vessel which can be accommodated on the various sections of the canal may be approximated by the information given in the following tables.

The maximum size of vessel which can be accommodated from Trenton to Swift Rapids, Severn River, is limited by the dimensions of the old lock at Buckhorn to one of 6-feet ( $1^m8$ ) draught, 127 feet ( $38^m7$ ) in length, if beam does not exceed 21 feet ( $6^m4$ ). Square-built scows of  $32\frac{1}{2}$  feet ( $10^m0$ ) beam, or less, can be accommodated to a length of 110 feet ( $33^m5$ ) only.

The maximum size of vessel which can be accommodated from Lake Ontario to Peterborough is one of 8 feet ( $2^m4$ ) draught, 162 feet ( $49^m4$ ) in length, if beam does not exceed 21 feet ( $6^m4$ ). Square-built scows of  $32\frac{1}{2}$  feet ( $10^m0$ ) beam, or less, can be accommodated to a length of 145 feet ( $44^m2$ ).

The maximum size of vessel which can be accommodated from Peterborough to Swift Rapids, Severn River, is limited by the dimensions of the old lock at Buckhorn to one of 6-feet ( $1^m8$ ) draught, 127 feet ( $38^m7$ ) in length, if beam does not exceed 21 feet ( $6^m4$ ). Square-built scows of  $32\frac{1}{2}$  feet ( $10^m0$ ) beam, or less, can be accommodated to a length of 110 feet ( $33^m5$ ) only.

The largest motor-boat which can be passed over the marine railways at Swift Rapids and Big Chute, Severn River, is one of 56 feet ( $17^m1$ ) in length,  $13\frac{1}{2}$  feet ( $4^m2$ ) beam, 4 feet ( $1^m2$ ) draught and weighing not more than 15 tons.

The maximum size of vessel which can be accommodated in the small lock 40 at Port Severn, is one of 6-feet ( $1^m8$ ) draught, 85 feet ( $25^m9$ ) in length, if beam does not exceed 24 feet ( $7^m3$ ). Square-built scows of  $24\frac{1}{2}$  feet ( $7^m5$ ) beam, or less, can be accommodated to a length of 75 feet ( $22^m9$ ) only.

The maximum size of vessels which can be accommodated on the Scugog Branch is one of 130 feet ( $39^m6$ ) in length, if beam does not exceed 21 feet ( $6^m4$ ). Square-built scows of  $32\frac{1}{2}$  feet ( $10^m0$ ) beam, or less, can be accommodated to a length of 110 feet ( $33^m5$ ). The available draught Sturgeon Lake to Lindsay is 6 feet ( $1^m8$ ); Lindsay to Port Perry,  $4\frac{1}{2}$  feet ( $1^m3$ ).

Charts 2010, 2011, 2012, 2013, 2014.

**Distances on route:**

		ft. in.		
5	Trenton to Rice Lake.....	8 0	navigation..	57.00 miles
	Rice Lake and to Peterborough.....	8 0	" ..	32.51 "
	Peterborough to Swift Rapids.....	6 0	" ..	134.94 "
	Swift Rapids to Big Chute.....	4 0	" ..	8.00 "
	Big Chute to Port Severn.....	6 0	" ..	8.10 "
10				240.55 miles
	Scugog Branch. Above Lindsay.....	4 0	" ..	35.00 "
	Buckhorn Lake to Chemong Park.....	6 0	" ..	9.00 "
	Pigeon Lake to Omemee.....	4 0	" ..	14.00 "
15	Total.....			298.55 miles

**Number of locks:**

	From Trenton to Balsam Lake—Ascending.....	35
	(Two of the above are hydraulic lift locks.)	
	From Balsam Lake to Port Severn—Descending.....	8
20	Scugog Branch—Ascending.....	1
		44
	Number of marine railways, Severn River.....	2
25	Total difference of elevation overcome by locks and railways in ascending.....	595 feet (181 <sup>m</sup> 4)
	Descending.....	260 " ( 79 <sup>m</sup> 2)
		855 feet (260 <sup>m</sup> 6)

Dimensions of locks and depths on sills. See table of mileage and general data,  
30 below.

**Depths of canal reaches:**—

	ft. in.	
35	Trenton to Rice Lake.....	9 0
	Rice Lake to Peterborough.....	8 0
	Peterborough to Swift Rapids.....	6 0
	Swift Rapids to Port Severn.....	6 0
	Scugog Branch—Sturgeon Lake to Lindsay.....	6 0
	Lindsay to Port Perry.....	4 0

With exceptions as noted  
below.\*

40	Capacity of marine railways at Swift Rapids and Big Chute:—	
	Vessels not exceeding.....	50 feet long (18 <sup>m</sup> 3)
		13 feet 6 inches beam
		4 feet draught
		15 tons in weight

45 Minimum breadth of canal cuttings at bottom, 50 feet (15<sup>m</sup>2).

## Trent-Severn Waterway—Mileage and General Data

(Lake Ontario—Mean level, 245.8 above M.S.L.  
Standard low water 243.0 above M.S.L.)

Miles from Trenton	Structure, Locality, etc.	Over- head Clear- ance	LOCKS				Canal Prism
			No.	Length Between Hollow Quoins	Min- imum	Depth on Sill	
		ft. in.		ft. in.	ft. in.	ft. in.	ft. in.
0.00	Entrance to Bay of Quinte						
0.00	Bridge—Trenton—Highway swing						
0.36	Bridge—Can. Nat. Rys.—Swing						
0.86	Bridge—Can. Pac. Ry.—High-level	43 4					
1.74	Bridge—Can. Nat. Rys.—High-level	30 6					
1.78	Trenton—Lock.....		1	175 0	33 0	8 0	17 7
2.41	Trenton—“		2	175 0	33 0	8 0	20 0
3.67	Bridge—Glen Miller—Highway swing						
3.85	Glen Miller—Lock.....		3	175 0	33 0	8 0	27 0
5.15	Township of Sydney—Lock.....		4	175 0	33 0	8 0	18 0
6.38	“ “ “ .....		5	175 0	33 0	8 0	18 0
7.26	Frankford—Lock.....		6	175 0	33 0	8 0	16 0
7.56	Bridge—Frankford—Highway swing.....						0.25
8.01	Emergency dam						1.75
13.82	Glen Ross—Lock.....		7	175 0	33 0	8 0	10 0
13.85	Emergency dam						0.50
13.86	Bridge—Glen Ross—Highway swing						
13.96	Bridge—Can. Nat. Rys.—Swing						
25.26	Township of Seymour—Lock.....		8	175 0	33 0	8 0	19 7
26.41	“ “ “ .....		9	175 0	33 0	8 0	16 0
27.99	“ “ “ .....		10	175 0	33 0	8 0	24 0
29.68	Ranney Falls “ .....		11) Flight	175 0	33 0	8 0	48 0
			12) Flight	175 0	33 0	8 0	
29.74	Emergency dam						
29.75	Bridge—Highway swing						
30.69	Bridge—Can. Nat. Rys.—Bascule						
30.77	Bridge—Can. Nat. Rys.—High-level..	28 8					
31.13	Bridge—Campbellford—Highway bas- cule.						1.00
32.17	Township of Seymour—Lock.....		13	175 0	33 0	8 0	23 0
33.70	“ “ “ .....		14	175 0	33 0	8 0	25 0
33.72	Emergency dam						
36.16	Heeley Falls—Lock.....		15	175 0	33 0	8 0	21 9 $\frac{1}{2}$
36.18	Bridge—Highway swing.....						
36.51	Heeley Falls—Lock.....		16) Flight	175 0	33 0	8 0	1.00
	“ “ .....		17) Flight	175 0	33 0	8 0	
36.56	Emergency dam						
37.11	Bridge—Highway swing						
43.38	Bridge—Highway swing						
51.13	Hastings—Lock.....		18	175 0	33 0	8 0	9 0
51.16	Bridge—Highway swing						
51.17	Emergency dam						
51.95	Bridge—Can. Nat. Rys. Swing						
57.00	Entrance to Rice Lake						
69.00	Mouth of Otonabee River						
76.53	Bridge—Bensfort—Highway swing						
80.35	Bridge—Hales—Highway swing						
88.74	Peterborough—Lock.....		19	134 0	33 0	6 0	8 0
88.83	Bridge—Highway swing						
88.94	Bridge—Can. Nat. Rys.—Swing						
89.51	Peterborough—Lock.....		20	142 0	33 0	6 0	12 0
89.61	Bridge—Maria St.—Swing						
89.72	Bridge—Can. Pac. Ry.—Swing						
90.10	Peterborough—Hydraulic lift lock.....		21	140 0	33 0	6 0	65 0
90.58	Bridge—Norwood road—High level...	23 8					
90.58	Guard gate						
91.01	Bridge—Warsaw road—Highway swing						
91.01	Guard gate						
93.25	Guard gate—Nassau						3.50

## Trent-Severn Waterway—Mileage and General Data—Continued

(Lake Ontario—Mean level, 245.8 above M.S.L.  
Standard low water 243.0 above M.S.L.)

Miles from Trenton	Structure, Locality, etc.	Over head Clearance	LOCKS					Canal Prism
			No.	Length Between Hollow Quoins	Minimum	Depth on Sill	Lift	
		ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	Miles
93.33	Bridge—Can. Nat. Rys.—Swing							
93.38	Bridge—Nassau—Highway swing							
94.25	Township of Douro—Lock.....	22	142 0	33 0	6 0	14 0		0.25
94.84	“ “ .....	23	142 0	33 0	6 0	12 0		
96.38	“ “ .....	24	142 0	33 0	6 0	12 0		0.25
97.29	“ “ .....	25	142 0	33 0	6 0	10 0		
98.72	Lakefield—Lock.....	26	142 0	33 0	6 0	15 8		
99.00	Bridge—Lakefield—High-level.....	23 6						0.50
99.04	Guard gate—Lakefield							
104.45	Bridge—Youngs Point—Highway swing							
104.47	Youngs Point lock .....	27	175 0	33 0	8 10	7 3		
104.49	Guard gate—Youngs Point							
112.87	Burleigh Falls—Lock.....	28	Flight	150 0	33 0	6 0		24 0
	“ “ .....	29	Flight	134 0	33 0	6 0		
113.00	Bridge—Burleigh Falls—Highway swing							
114.75	Lovesick—Lock.....	30	134 0	33 0	6 0	3 6		
120.66	Buckhorn—Lock.....	31	134 0	33 0	6 0	11 6		
120.66	Bridge—Buckhorn—Highway swing.....							0.25
132.68	Bridge—Bridgenorth, Chemong Lake—Floating bridge with steel swing span.							
130.17	Bridge—Gannons Narrows—Floating bridge with swing span.							
138.17	Bridge—Bobcaygeon—Swing							
138.21	Bobcaygeon—Lock.....	32	175.0	33 0	6 0	5 5		0.25
138.23	Guard gate							
148.00	Sturgeon Point							
156.19	Bridge—Wellington Street, Lindsay—Highway bascule.							
156.31	Bridge—Lindsay Street—Swing.....							
156.35	Lindsay—Lock.....							
157.20	Bridge—Can. Nat. Rys.—High-level.....	31 0	142 0	33 0	6 0	7 0		
157.87	Bridge—Ops—Highway fixed span.....	10 0						
183.00	Port Perry							
153.61	Fenelon Falls locks.....	33	Flight	150 0	33 0	6 0		
	“ “ .....	34	Flight	134 0	33 0	6 0		
153.61	Bridge—Highway swing							
153.98	Bridge—Can. Nat. Rys.—Swing							
157.17	Rosedale lock.....	35	175 0	33 0	6 0	4 0		1.00
157.19	Emergency dam							
158.00	Bridge—Rosedale—Highway swing							
158.10	Entrance to Balsam Lake							
	(Balsam Lake—summit level, 841.0 above M.S.L.)							
163.91	Guard gate—Balsam Lake							
165.24	Bridge—Victoria road—Highway sw'g							
166.80	Bridge—Portage road—High-level.....	23 7		“				
167.88	Guard gate							
167.98	Bridge—Can. Nat. Rys.—High-level.....	23 4						6.0
169.26	Guard gate—Kirkfield							
169.36	Kirkfield—Hydraulic lift lock.....	24 10	36	140 0	33 0	6 0	49 0	
172.98	Bridge—High-level arch.....	28.1						
175.23	Bridge—Balsover—Highway swing							
176.65	Bridge—Boundary road—Highway swing.							

## Trent-Severn Waterway—Mileage and General Data—Concluded

(Lake Ontario—Mean level, 245.8 above M.S.L.  
Standard low water 243.0 above M.S.L.)

Miles from Trenton	Structure, Locality, etc.	Over- head Clear- ance	LOCKS					Canal Prism
			No.	Length Between Hollow Quoins	Min- imum	Depth on Sill	Lift	
		ft. in.		ft. in.	ft. in.	ft. in.	ft. in.	Miles
177.04	Township of Thorah lock.....	37	142 0	33 0	6 0	21 8½		6.0
178.05	Township of Mara lock.....	38	142 0	33 0	6 0	14 0		
179.07	Bridge—Kanes—Highway swing							
179.63	Township of Thorah lock.....	39	142 0	33 0	6 0	13 0		
180.09	“ “ “ .....	40	142 0	33 0	6 0	44 0		3.0
180.74	“ “ “ .....	41	142 0	33 0	6 0	11 6		
180.79	Bridge—Gamebridge—Highway swing							
181.70	Bridge—Can. Nat. Rys.—High-level..	22 8						
181.85	Bridge—Can. Nat. Rys.—Swing							
182.15	Bridge—Lakeshore road—Highway Swing							
182.20	Entrance to Lake Simcoe							
(Lake Simcoe level—718.3 above M.S.L.)								
197.56	Bridge—Atherley road—Highway swing.							
197.66	Bridge—Can. Nat. Rys.—Atherley Narrows—swing							
208.24	Bridge—Muskoka road—Highway Swing							
209.14	Bridge—Can. Nat. Rys.—Washago— swing							
209.87	Guard gate—Couchiching							
209.89	Couchiching—Lock.....	42	175 0	33 0	7 0	20 3		3.0
209.90	Bridge—Couchiching—Highway high- level	31						
212.73	Bridge—Halet—Highway swing							
222.40	Bridge—Can. Nat. Rys.—Ragged Rapids—High-level.....	32 0						
224.45	Swift Rapids marine railway.....		(60 0	13 6	4 0)	47 0		
228.07	Bridge—Can. Pac. Ry.—Severn Falls— High-level.....	33 7						
232.45	Big Chute—Marine railway.....		(60 0	13 6	4 0)	58 0		
240.55	Port Severn lock.....		100 0	25 0	6 0	12 0		
240.55	Bridge—Port Severn—Highway swing							
240.56	Entrance to Georgian Bay							
(Lake Huron—Mean level 581.6 above M.S.L. Standard low water 578.5 above M.S.L.)								
								33.25

The depth of water on lock sills varies with prevailing water levels. The depths at locks opening on Lake Ontario, Lake Simcoe and Georgian Bay have been as low as the following during the navigation season:—

Lock 1, Trenton..... 7'4" on October 28, 1934.  
Lock 41, Gamebridge..... 7'0" on August 30, 1941.  
Lock 42, Couchiching..... 7'8" on October 17, 1929.  
Lock at Port Severn..... 6'2" on August 21, 1926.

Rules and Regulations.—See pages 25 to 31.

# CHAPTER III

## LAKE ONTARIO

### FALSE DUCKS ISLANDS TO PRESQU'ILE BAY

Chart 2060.

5 The coast of Prince Edward County, from the point of the same name to Point Petre, 16 miles westward, is low, swampy in places, and has no conspicuous features. The farmhouses are distant one to 2 miles from the lake shore and few of them are visible from the offing.

10 The slight indentations of the shore form points and bays of no importance. Most of the coast is bordered with shallow water, or rocky shoal flats covered with numerous boulders, extending out as much as three-quarters of a mile, making the landing difficult and dangerous. The shorebank, except near Point Petre, is one to  $1\frac{1}{2}$  miles in width.

15 **Preston Reef** is rocky, covered with willows, lying 400 yards (365<sup>m</sup>8) off-shore,  $5\frac{3}{4}$  miles westward of False Ducks Islands lighthouse. Shoals under 6 feet (1<sup>m</sup>8) extend half a mile southwestward of it.

20 **Danger area.**—The area within the following boundaries is used by the Royal Canadian Air Force for practice air firing and bombing:—From Ostrander Point (*Lat. 43° 53' 57" N. Long. 76° 58' 50" W.*) for 120°, 2.75 miles; thence 227° for 3.40 miles; thence 335° for 3.40 miles. The limits of the danger area are marked by five orange spar buoys.

25 **Charwell Point** is a narrow sand and gravel bar, 2 to 3 feet (0<sup>m</sup>6 to 0<sup>m</sup>9) in height, which projects out one-third of a mile southeastward,  $3\frac{1}{4}$  miles eastward of Point Petre. It is surrounded with rocky flats covered with numerous boulders, which, under the depth of 6 feet (1<sup>m</sup>8), extend out half a mile southwestward from the end of the bar.

30 **Point Petre** is the southernmost point of Prince Edward County. It is low and sparsely wooded. Shoals, under a depth of 6 feet (1<sup>m</sup>8) extend southwestward from the point for a quarter of a mile, and the 5-fathom (9<sup>m</sup>1) line rounds the point at a distance of half a mile.

**Light—Fog signal.**—A light is exhibited, at an elevation of 62 feet (18<sup>m</sup>9), from a white, circular tower on the southern extremity of Point Petre.

A fog diaphone is sounded at the light station.

35 **Danger area.**—A practice firing area has been established within the following boundaries:—From a position in *Lat. 43° 52' 30" N. Long. 77° 04' 10" W.* for 090°,  $12\frac{1}{2}$  miles; thence 60° of arc-radius  $12\frac{1}{2}$  miles—centre in *Lat. 43° 52' 30" N. Long. 77° 04' 10" W.*; thence 240° for 6 miles; thence 105° of arc-radius  $12\frac{1}{2}$  miles—centre Point Petre light; thence 15° of arc-radius  $12\frac{1}{2}$  miles—centre *Lat. 43° 50' 50" N. Long. 77° 09' 40" W.*; thence 090°,  $12\frac{1}{2}$  miles to a point on shore.

## Chart 2060.

**Soup Harbour.**—From Point Petre, the shore turns abruptly northward, partly surmounted by rock cliffs 15 feet (4<sup>m</sup>6) in height, forming the east shore of Soup Harbour. At one mile from the point, it alters its character to that of a low, gravelly and rocky beach partly strewn with boulders, gradually turning westward towards Wicked Point, 4 miles westward. 5

**Wicked Point** (*Lat. 43° 51' N. Long. 77° 15' W.*).—On the southwest extremity of this thickly wooded point, which separates Soup Harbour from Athol Bay, is erected a white, square, wooden tower, with dwelling attached, bearing 286°, distant 4 $\frac{1}{2}$  miles from Point Petre lighthouse. No light is shown 10 from this tower.

**Breakwater.**—Close eastward of the southeastern extremity of Wicked Point is a Government breakwater, 315 feet (96<sup>m</sup>0) long. The eastern side provides shelter for small boats.

**Wicked Bank** is the rocky spit, which makes out 2 miles in a south- 15 westerly direction, from Wicked Point. On this spit, shoals under the depth of 6 feet (1<sup>m</sup>8) extend out two-thirds of a mile, and those under 18 feet (5<sup>m</sup>5) 1 $\frac{1}{2}$  miles. The 5-fathom (9<sup>m</sup>1) line, which from Point Petre runs almost straight, rounds the latter 300 yards (274<sup>m</sup>3) farther out, 2 miles off Wicked Point.

**Athol Bay**, between the last described point and Owen Point, is 2 $\frac{1}{2}$  miles 20 wide and 2 miles long. Off the outer portion of the southeast side of the bay, the deep water is fairly close in. The head of the bay consists of a sand beach, affording good landing; the 5-fathom (9<sup>m</sup>1) line approaches to within one mile of it. **Spence Lake** empties into Athol Bay through the sand beach. There are summer resorts on this lake and also on **Yoe Lake**. 25

**Anchorage**, in 6 to 8 fathoms (11<sup>m</sup>0 to 14<sup>m</sup>6) over sand, may be found in Athol Bay affording good shelter in winds from north to southeast.

**Owen Point** is the northwest entrance point of Athol Bay. It is situated 3 miles northwestward of Wicked Point.

**Wellington Bay** is the large open space lying between Owen and Huyck 30 Points. It takes its name from the village of Wellington, which is situated at the head of the bay, 5 miles northwestward of Owen Point.

The east side of the bay, being nearly straight, trends northwesterly. It consists of a narrow strip of land, separating Yoe Lake from Lake Ontario, on the southern portion of which are sand dunes, 45 feet (13<sup>m</sup>7) in height and sparsely covered with coniferous trees; the northern portion is low and sandy. There is a narrow and shallow opening in this sand bar near Wellington, leading into Yoe Lake, which, however, is entirely closed up at times. 35

**Shoals.**—Two narrow patches of boulders extend southwestward from the east side of Wellington Bay, at distances of 1 $\frac{1}{2}$  miles and 3 miles from Wellington, respectively; the former has 15 feet (4<sup>m</sup>6) of water upon it, two-thirds of a mile out, and the latter has 13 feet (4<sup>m</sup>0) on it, one mile out. 40

The 5-fathom (9<sup>m</sup>1) line rounds these two shoals 1 $\frac{1}{2}$  miles out.

Charts 2060, 2061.

Wellington, in Prince Edward County, is situated close to the shore at the head of the bay of the same name. In 1956, it had a population of 1,077. A tall pine tree, about one mile northwestward of the village, shows up conspicuously, being seen from a considerable distance seaward. At one time, Wellington was a shipping port for grain, but its wharves have fallen into decay. It is a station on the branch line of the Canadian National Railways, which runs between Picton (11 miles eastward) on Bay of Quinte, and Trenton Junction, 19½ miles northwestward by rail. At the latter point, connection is made with the main lines of the Canadian Pacific and the Canadian National Railways between Montreal, Kingston, and Toronto.

**Government wharf.**—There is a Government wharf, 232 feet (70<sup>m</sup>7) long, extending to a depth of about 5 feet (1<sup>m</sup>5). The channel leading to the wharf has been dredged to the same depth.

15 **Coast.**—From Wellington to **Huyck Point**, 7½ miles westward, the shore forms a slight outward curve, with a shorebank less than half a mile in width. This coast has no other conspicuous features than a few farmhouses and barns, some of which are situated close to the shore.

20 **Scotch Bonnet Island**, small, flat, and bare, lies 3 miles southwestward of Huyck Point. Shoals under 6 feet (1<sup>m</sup>8), extend a quarter of a mile southeastward, with deep water a short distance off. The 5-fathom (9<sup>m</sup>1) line rounds the east side of the island at a distance of half a mile. On the north and west sides, the deep water is close to the island.

25 The passage between Scotch Bonnet Island and Nicholson Island is nearly one mile in width and has depths of 7 to 11 fathoms (12<sup>m</sup>8 to 20<sup>m</sup>1).

**Light.**—A light is exhibited, at an elevation of 51 feet (15<sup>m</sup>5), from a white, circular tower with dwelling attached, on Scotch Bonnet Island.

30 **Scotch Bonnet Shoal**, with a least depth of 14 feet (4<sup>m</sup>3) over it, is one mile long east and west and half a mile in width under the depth of 5 fathoms (9<sup>m</sup>1). The shoalest spot bears 189°, and is distant 2½ miles from Scotch Bonnet Island lighthouse.

The west end of Nicholson Island in line with Scotch Bonnet Island lighthouse, bearing 208°, leads 300 yards (274<sup>m</sup>3) westward of the above shoal.

35 **Palen Bank**, rocky, small in extent, has 24 feet (7<sup>m</sup>3) over its shoalest part, bearing 131°, and distant 2½ miles from Scotch Bonnet lighthouse.

**McFaul Shoal** is a pinnacle of rock, with 18 feet (5<sup>m</sup>5) over its apex. It lies 094°, distant 3 miles from Scotch Bonnet Island lighthouse.

40 **Nicholson Island**, heavily wooded, one mile long easterly and westerly, and one-third of a mile in width, the western extremity of which bears 028° distant nearly one mile from Scotch Bonnet Island lighthouse, is separated from the point of the same name by a shallow passage three-quarters of a mile in width.

45 The 5-fathom (9<sup>m</sup>1) line approaches to within 200 yards (182<sup>m</sup>9) of all but the east side, from which a spit extends half a mile eastward, leaving a narrow winding channel between it and the shorebank extending from Huyck Point. This channel has a greatest depth of 21 feet (6<sup>m</sup>4), but should not be attempted by any one not well acquainted with the locality.

## Charts 2060, 2061

At Huyck Point, the shore turns abruptly northwestward and trends in that direction for a distance of 9 miles, to the entrance into Wellers Bay, forming several small points with outlying boulders, and small bays with sand or gravel beaches affording good landing. Off this coast, the soundings are more or less irregular, some shoals lying a considerable distance out. 5

Vessels, when eastward of a line between Scotch Bonnet Island and Presqu'ile Point lighthouses, should exercise due caution.

**Moira Shoal.**—From **Island Point**, situated  $023^{\circ}$ , distant 3 miles from Scotch Bonnet Island lighthouse, a bank extends out  $1\frac{1}{2}$  miles southwestward. 10 Moira Shoal, having a least depth of  $7\frac{1}{2}$  feet ( $2^{\text{m}}3$ ) of water upon it, lies  $1\frac{1}{4}$  miles out on the southwestern end of this bank. It bears  $001^{\circ}$ , distant 2 miles from Scotch Bonnet Island lighthouse.

## Charts 2071, 2061, 2069.

**Presqu'ile Bay.**—This bay, a natural harbour, takes its name from the 15 peninsula of the same name which encloses it westward and southward, giving it entire protection from the force of storms. The length of the bay varies between  $1\frac{1}{4}$  and 2 miles northeastward and southwestward, and it has a least width of  $1\frac{1}{4}$  miles. Its shores are bordered on all sides with shallow mud flats more or less covered with weeds. Additional protection is given to the bay by 20 the bar which extends across its entrance from **Shoal Point**, the north entrance point, to **Salt Point** situated half a mile northwestward of **Presqu'ile Point** lighthouse. The channel through the bar had a least depth of 7 feet ( $2^{\text{m}}1$ ), in 1957.

The western entrance of Murray Canal, which connects Bay of Quinte 25 and Presqu'ile Bay, thus affording an alternative route from and to Kingston, is situated in the northeast corner of the bay.

**Presqu'ile Park** comprises the whole of the peninsula including Proctor Point (see page 59). There are numerous cottages on the inner shore of the point from the lighthouse to the western extremity. 30

**Light.**—A light is exhibited, at an elevation of 67 feet ( $20^{\text{m}}4$ ), from a white, octagonal stone tower on the eastern extremity of Presqu'ile Point.

**Caution.**—In the arrangement of buoys at the entrance of and inside Presqu'ile Bay, the bay, in connection with Murray Canal, has been considered as being a continuous passage from the east end of Bay of Quinte. Consequently 35 vessels entering Presqu'ile Bay from Lake Ontario, and also inside of the bay, must leave the red buoys on the port hand and the black buoys on the starboard hand.

**Buoyage.**—A black spar buoy, No. 21, is moored on the southern edge of **Middle Ground**, about  $3\frac{1}{2}$  cables northward of Presqu'ile Point lighthouse. 40 A red light-buoy, showing a *flashing red* light, marks the northern edge of **Salt Reef**, which extends northward from Salt Point.

Red and black spar buoys mark the channel through Presqu'ile Bay leading to the Murray Canal.

**Leading Lights.**—Three white, square, wooden towers, numbered 1, 2, 45 and 3, are erected on cribs on the north side of Presqu'ile Bay in waters of different depths. A *fixed red* light is exhibited from No. 1, a *flashing white* from No. 2, and a *fixed white* light from No. 3.

Charts 2071, 2061, 2069.

The bearing and distance from Presqu'ile Point lighthouse (*Lat. 44° 00' N. Long. 77° 41' W.*) to No. 1 light is  $301^\circ$ ,  $3\frac{1}{4}$  miles; to No. 2 light,  $302^\circ$ ,  $2\frac{3}{4}$  miles; to No. 3 light,  $324^\circ$ ,  $2\frac{1}{4}$  miles.

5 No. 2 and No. 1 lights in line, bearing  $294\frac{1}{2}^\circ$ , mark the axis of the cut, with a depth of 7 feet ( $2^m1$ ) in 1957, through the bar across the entrance of the bay. Each side of this cut is marked with spar buoys.

10 No. 2 and No. 3 lights in line, bearing  $067^\circ$ , mark the axis of the cut, with a least depth of 8 feet ( $2^m4$ ) in 1957, through the mud flats in the northeast corner of the bay, leading to the entrance of Murray Canal. The south side of this cut is marked with four black spar buoys.

**Buoy.**—A red spar buoys marks the ruins of the old Brighton leading light No. 1 pier. It is located on the south side of the ruins southeastward of Brighton leading light No. 2.

15 **Wharf.**—Close westward of Salt Point is a Government wharf 100 feet ( $30^m5$ ) long, with a depth of 13 feet ( $4^m0$ ) alongside. The channel leading to the wharf, 90 feet ( $27^m4$ ) wide, has been dredged to a depth of  $11\frac{1}{2}$  feet ( $3^m6$ ).

20 **Directions.**—A vessel entering Presqu'ile Bay should, when abreast of the lighthouse on the south entrance point, be steering  $294\frac{1}{2}^\circ$  with No. 2 and No. 1 leading lights in line. These leading lights should be carefully kept in line, as the dredged cut is very narrow, till No. 3 light bears about  $047^\circ$ , whence it should haul northward and head on the latter light. Pass southward of and close to No. 3 light, then bring the latter light in line with No. 2, the front light of the above range, directly over the stern. This portion of the channel 25 should not be attempted without local knowledge, as it is subject to extensive silting.

Vessels other than small craft should not attempt to pass northward of No. 3 light.

30 **Light.**—A light is exhibited, at an elevation of 27 feet ( $8^m2$ ), from a white, circular column rising from a hexagonal base, on the outer end of the north pier at the western entrance to Murray Canal.

**Anchorage** may be found in Presqu'ile Bay, in 10 to 11 feet ( $3^m0$  to  $3^m4$ ) over thick mud, southwest of the alignment of range lights No. 2 and No. 1, affording entire protection in all winds.

35 **Brighton**, with a population of 2,182 in 1956, is a village on the main line of the Canadian National and Canadian Pacific Railways and is situated  $1\frac{3}{4}$  miles back from the shore of Presqu'ile Bay. At the shore, where once stood Brighton wharf, are a number of cottages forming what is known as **Gosport**. Brighton wharf has been abandoned. To the westward of this old wharf, and 40 extending nearly as far offshore, is a line of stone-filled cribs, which are the remains of a former pier.

Charts 2061, 2069.

45 **Pilotage.**—Any one not well acquainted should take a pilot, if using the Bay of Quinte route. These pilots, although quite reliable, are not licensed. They can be taken on at Kingston, where most of them live, or arrangements can be made in advance for them to meet eastbound vessels at Presqu'ile Bay. They have no set charges.

## Chart 2061, 2069.

**Bald Head Island.**—The northeast part of this island is heavily wooded, the southwest part is in pasture. From the north side of the island, a bare and narrow strip of land, consisting mostly of sand and gravel, extends two-thirds of a mile northwestward, leaving a gap 400 yards (365<sup>m</sup>8) in width between it and the mainland. This gap, the only accessible entrance into **Weller Bay**, is situated 3½ miles northeastward of Presqu'ile Point lighthouse.

Just inside of Bald Head are **Fox** and **Bald Islands**, in Weller Bay. **Gardenville Village** is situated near the northern part of Weller Bay near **Pine Point**, where an old railway terminal pier stood. North of Pine Point, and the nearest water to Bay of Quinte, is **Young Cove** from which there once led a portage trail overland by way of **Carrying Place**.

**Stoneburg Cove** in Weller Bay is just west of Young Cove and bordering it is **Barcovan Beach** with a number of cottages.

**Becroft Point**, (*Lat. 44° 00' N. Long. 77° 36' W.*) bearing about 083°, 15 and distant 3½ miles from Presqu'ile Point lighthouse, is the northern extremity of a narrow strip of sand beach. This extends 1½ miles northwesterly from the sand dunes situated close to the lake shore, 5 miles, 100° from Presqu'ile Point lighthouse. These sand dunes, 20 feet (6<sup>m</sup>1) in height, are fairly conspicuous and are partly covered with coniferous trees.

The gap, 500 yards (457<sup>m</sup>2) in width, which separates Bald Head Island and Becroft Point is very shallow; when the lake level is low it may become almost dry.

**Becroft Clump.**—One-third of a mile southeastward from the end of Becroft Point, there is a small knoll 10 feet (3<sup>m</sup>0) in height, from which rises a 25 small but fairly conspicuous clump of trees.

**Weller Bay**, separated from Lake Ontario by Bald Head Island and the narrow strip of land described under the heading of Becroft Point, is three-quarters of a mile to 1¼ miles in width and 5 miles in length. Vessels drawing 10 feet (3<sup>m</sup>0) can find a good shelter in the northern part of the bay. The 30 southern part, with depths of 12 to 19 feet (3<sup>m</sup>7 to 5<sup>m</sup>8), is accessible only for small craft, because of the bar which extends across the bay from Bald Head Island, and upon which there is a greatest depth of 5 feet (1<sup>m</sup>5). The village of **Consecon** is situated on the southeast side of the bay.

**Smoke Point** is abreast of Bald Head Island; next south of it is **Sugar Point**, and the northernmost islet in the east end of Weller Bay, off Consecon, is **Bigelow Island**.

## Chart 2061.

**Dobbs Bank**, rocky, extends southwestward from Becroft Point. It is 40 about two-thirds of a mile wide and 3 miles long, under the depth of 5 fathoms (9<sup>m</sup>1). Its southwest extremity bears 141°, and is distant 2½ miles from Presqu'ile Point lighthouse.

On the above bank, there is a depth of 6 feet (1<sup>m</sup>8) of water, over smooth rock, bearing 115°, and distant 3 miles from Presqu'ile Point lighthouse.

**Quick Shoal**, isolated, rocky, small in extent, with a least depth of 18 45 feet (5<sup>m</sup>5) of water over it, lies 119°, distant 1½ miles from Presqu'ile Point lighthouse.

*Chart 2061.*

**Gore Shoal**, isolated, rocky, three-quarters of a mile long east and west under the depth of 5 fathoms ( $9^{\text{m}1}$ ), and one-third of a mile wide, has a least depth of 17 feet ( $5^{\text{m}2}$ ) of water upon it. It lies  $167^{\circ}$  and is distant  $1\frac{1}{2}$  miles  
5 from Presqu'ile Point lighthouse.

## CHAPTER IV

### LAKE ONTARIO

### PRESQU'ÎLE BAY TO TORONTO

Chart 2061.

**Proctor Point.**—The west side of Presqu'île Peninsula, with Proctor Point, which extends  $1\frac{1}{2}$  miles southwestward from it, forms the east and the southeast side of Popham Bay. The inner part of this narrow point being partly awash, Proctor Point, when seen from the southeast, has the appearance of an island. The western outer part of the point is heavily wooded; the remainder is partly cultivated. 5  
10

**Chatterton Point** is the almost indistinguishable southernmost point of Presqu'île Peninsula.

At Presqu'île Point, and for a distance of  $1\frac{1}{2}$  miles westward from its east end, the shorebank, on the south side, is a little less than half a mile in width. Off the bay between Presqu'île Point and Proctor Point, the shorebank is three-quarters of a mile wide. On the south side of Proctor Point, the deep water is close in, but on the east side, rocky shoal flats extend one-third of a mile eastward. 15

**Danger area.**—The following area has been reserved by the Royal Canadian Air Force as a practice bombing and firing range:— 20

From a position,  $174^\circ$  Oshawa west pier  $2\frac{1}{2}$  miles, the area is enclosed by a line extending  $080^\circ$  for 51 miles; thence  $170^\circ$  for 14 miles; thence  $262^\circ$  for 51 miles; thence in a  $349\frac{3}{4}^\circ$  direction for  $12\frac{1}{2}$  miles to the point of beginning.

The northern boundary is marked at each end by a can buoy and the interval by 49 spar buoys, moored approximately one mile apart. All buoys are painted International Orange in colour. 25

A rocky bank, the southwest extreme of which bears  $274^\circ$ , distant  $1\frac{1}{2}$  miles from the southwest extremity of Proctor Point, (*Lat.  $43^\circ 58' N.$ , Long.  $77^\circ 45' W.$* ) extends northwestward into Popham Bay from the same point. This bank is very shallow northward from Proctor Point. On the same bank, there is also a depth of  $7\frac{1}{2}$  feet ( $2^m3$ ), over rock bearing  $322^\circ$ , distant three-quarters of a mile from the southwest extremity of Proctor Point. 30

**Spencer Point**, the west point of Popham Bay, is a slight projection of the north shore. A bank, 25 feet ( $7^m6$ ) high, skirts the shore closely for a short distance on each side of the point. Off the point and for a distance of one mile eastward, shoals under the depth of 6 feet ( $1^m8$ ) extend out one-quarter of a mile. 35

An isolated shoal, a quarter of a mile in diameter, with 21 feet ( $6^m4$ ) least water upon it, lies  $191^\circ$  one mile from Spencer Point. The southwest side of Nicholson Island open of Proctor Point, bearing  $110^\circ$ , leads over this shoal. 40

**Popham Bay** is described under the heading of Proctor Point and under that of Spencer Point. The head of the bay consists of a sand beach off which shallow sand flats extend out one cable. There is a golf course on the sandy beach from Owen Point to the mainland.

## Chart 2061.

**Anchorage** in  $3\frac{1}{2}$  fathoms (6<sup>m</sup>4) will be found in Popham Bay, affording shelter in winds from northward to southeastward.

5 **Camel Shoal**, isolated, rocky, with 14 feet (4<sup>m</sup>3) least water upon it, is three-quarters of a mile northeast and southeast, and one-third of a mile in width. The shoalest water is near the southeast edge of the middle portion of the patch; it bears 216°, and is distant one mile from Proctor Point. Between the shoal and Proctor Point there are depths of  $6\frac{1}{2}$  fathoms (11<sup>m</sup>9).

10 The east side of the northern part of Proctor Point in line with the east side of the southern part of the same point, bearing 023°, leads in deep water half a mile eastward of Camel Shoal. Presqu'ile Point lighthouse in line with the southern extreme of Proctor Point, bearing 063°, leads in deep water only 150 yards (137<sup>m</sup>2) northward of the patch, but, one-quarter of a mile from its shoalest part.

15 **Collier Shoal**, isolated, rocky, with 17 feet (5<sup>m</sup>2) least water upon it, is one mile long eastward and westward, and half a mile wide. The shoalest water is on the north side of the middle portion of the patch; it bears 259°, and is distant 3 miles from Proctor Point.

20 The north side of the sand dunes described under the heading of Beecroft Point (see page 57), in line with the south extremity of Proctor Point, bearing 084°, leads on to the north edge of Collier Shoal. The clump of trees on Beecroft Point in line with the south extreme of Proctor Point leads over the deeper part of the shoal, 21 feet (6<sup>m</sup>4), one cable southward of its shoalest part, bearing 076°.

25 **Coast.**—From Spencer Point to **Ogden Point**, (*Lat. 43° 58' N., Long. 77° 53' W.*), a distance of  $4\frac{1}{2}$  miles, the shore trends southwestward. A clay bank skirts the western part of this shore closely, leaving little or no space for landing. The latter point has no conspicuous marks. It bears 272°, and is distant  $6\frac{1}{2}$  miles from Proctor Point. At Spencer Point, the shorebank is three-quarters of a mile in width; it gradually diminishes, in width toward Ogden Point where it is only half a mile wide.

30 **Colborne.**—The village of Colborne, a station on the main lines of the Canadian Pacific and Canadian National Railways, is situated  $1\frac{1}{2}$  miles northward of Ogden Point. The population, in 1956, was 1,240. Colborne wharf, two-thirds of a mile eastward of Ogden Point, has been abandoned.

35 The small village of **Lakeport** is situated on the lake shore, one mile westward of Ogden Point. The wharf here has been abandoned.

40 **Mulcaster Patch**, with 36 feet (11<sup>m</sup>0) of water over it, is only half a mile long northwest and southeast under depths of less than 10 fathoms (18<sup>m</sup>3). It lies 6 miles offshore, 111° distant  $12\frac{1}{2}$  miles from Cobourg west outer pier light, and 238° distant 11 miles from Proctor Point.

45 **Mulcaster Point** is situated  $2\frac{1}{2}$  miles westward of Ogden Point. In the bay between them, the shorebank is half a mile wide. Three-quarters of a mile eastward of the point, there is a depth of 6 feet (1<sup>m</sup>8), 400 yards (365<sup>m</sup>8) out. At Mulcaster Point and for a distance of about half a mile on each side, a clay bank, 30 feet (9<sup>m</sup>1) high, skirts the shore closely. On the point, a short distance inward, a windmill shows up well above the trees which fringe the edge of the bank.

## Chart 2061.

**Chub Point**, low and unimportant, is situated  $3\frac{1}{2}$  miles westward of the above point. In the bay between them, there is a low sand beach affording good landing. One mile eastward of the point, shoals under 6 feet (1<sup>m</sup>8) extend out one-quarter of a mile. At the point, the shorebank is one-quarter of a mile wide. 5

## Charts 2070, 2061.

From Chub Point to Cobourg, 8 miles westward, the slight indentations of the shore form points and bays of no importance. Clay banks, varying in height between 15 and 50 feet (4<sup>m</sup>6 and 15<sup>m</sup>2), skirt most of this shore closely. 10 The shorebank attains a width of three-quarters of a mile  $2\frac{1}{2}$  miles westward of Chub Point, but diminishes in width toward Cobourg.

**Lucas Point** (*Lat. 43° 57' N., Long. 78° 07' W.*), 15 feet (4<sup>m</sup>6) high, is a low projection  $2\frac{3}{4}$  miles east of Cobourg Harbour.

**Cobourg**, a residential town in Northumberland County, is a station on 15 the main lines of the Canadian Pacific and the Canadian National Railways between Montreal and Toronto. In 1956, it had a population of 9,399. The town is situated close to the lake shore on low and fairly level land. Its conspicuous marks are the steeples of three of its churches, the town hall and the asylum each with its small cupola, and the tall chimney of the waterworks pumping house, situated near the edge of the bank on the lake shore, half a mile east of the harbour. There is a hospital at Cobourg. 20

Fine sand beaches extend both east and west of the harbour entrance.

**Cobourg Harbour.**—The outer harbour is formed by the outer part of 25 the east pier and the west pier.

The east pier, 1,900 feet (582<sup>m</sup>1) long, with several slight bends, runs out in a southerly direction from the foot of Division Street.

The west pier, the inner end of which is 450 yards (411<sup>m</sup>5) westward of the east pier, extends 1,200 feet (365<sup>m</sup>8) southward from the foot of Hibernia Street, thence, making an angle of 120°, it extends 730 feet (222<sup>m</sup>5) eastward thus enclosing the outer harbour, and leaving an entrance 375 feet (114<sup>m</sup>3) in width. 30

The inner harbour is formed by the central pier and the inner part of the east pier.

The central pier, the inner end of which is 750 feet (228<sup>m</sup>6) westward of the east pier, a small pier 220 feet (67<sup>m</sup>1) long, extends westward toward the central pier, leaving an opening 330 feet (100<sup>m</sup>6) in width, the entrance into the inner harbour.

The Esplanade wharf occupies the north end of the harbour and has a depth of 13 feet (4<sup>m</sup>0) in the berth at its face. The berth on the south side of the centre pier, 250 feet (76<sup>m</sup>2) in length, has a depth of 15 feet (4<sup>m</sup>6). The berth inside the checkwater arm, alongside the east pier, 270 feet (82<sup>m</sup>3) in length, has a depth of 13 feet (4<sup>m</sup>0). The channel between the entrance piers is 18 feet (5<sup>m</sup>5) and the channel to the inner harbour 16 feet (4<sup>m</sup>9) deep. 40

The harbour is very important, being the only one on Lake Ontario to 45 which there is both summer and winter navigation. The car ferry slip is situated at the inshore end of the central pier on the northern side. The harbour requires annual maintenance dredging.

## Charts 2070, 2061.

**Lights.—Fog signal.**—A light is exhibited, at an elevation of 32 feet (9<sup>m</sup>8), from a concrete mast with a shed at the base, on the outer end of Cobourg West pier.

5 A light is exhibited, at an elevation of 45 feet (13<sup>m</sup>7), from a concrete pyramid, on the outer end of the East Pier.

A fog diaphone is sounded at the outer end of East Pier.

The outer ends of the inside piers are illuminated. The lights are not visible from seaward.

10 **Leading lights.**—Leading lights are shown at Cobourg. The front light is exhibited, at an elevation of 30 feet (9<sup>m</sup>1), from a lantern in front of a white, diamond-shaped daymark on a mast on the East Pier, about 2 cables from the outer end; the near light is exhibited, at an elevation of 38 feet (11<sup>m</sup>6), from a similar structure, 376 feet (114<sup>m</sup>6), 008° from the front light.

## 15 Chart 2058.

**Peter Rock,** (Lat. 43° 56' N., Long. 78° 14' W.), small in extent, partly awash, and lying offshore about 3 miles eastward of Port Hope, is connected to the main shore by a rocky ridge trending northeast, with depths of less than 6 feet (1<sup>m</sup>8) upon it. Southward and westward of Peter Rock, depths increase 20 to 30 feet (9<sup>m</sup>1) in one-third of a mile.

**Light.**—A light is exhibited, at an elevation of 45 feet (13<sup>m</sup>7), from a white, circular tower on Peter Rock.

The course and distance from a point one mile 008° from Cobourg west pier light, to 2<sup>1</sup>/<sub>2</sub> miles south of Point Petre light is 51<sup>1</sup>/<sub>2</sub> miles, 102°; to Oswego 25 N.Y., 112° 88<sup>1</sup>/<sub>2</sub> miles; to Little Sodus Bay, 118°, 82.5 miles; to Great Sodus Bay, 126°, 74 miles; to Charlotte, N.Y., 146°, 53<sup>1</sup>/<sub>2</sub> miles; to Port Dalhousie, Ont., 228°, 74 miles; to eastern entrance of Toronto Harbour, 249°, 62 miles.

## Charts 2070, 2058.

**Port Hope**, a town in Durham County, is a station on the main lines 30 of the Canadian Pacific and the Canadian National Railways from Montreal to Toronto. In 1956, it had a population of 7,522. The town is built close to the harbour on the rising land on each side of Ganaraska River which empties into the harbour. It also extends westward to the summit of a hill, about 175 feet (53<sup>m</sup>3) in height, the south slope of which rises rapidly from the 35 lake shore.

On the harbour front are situated the plants of the Port Hope Sanitary Mfg. Co., and the Agricultural Chemical Co. Ltd., two elevators, and the Mathews Conveyor Co., Ltd.

There is a refinery here for the extraction of radium from the ores.

40 It's conspicuous marks are the steeple of the Roman Catholic Church and that of the United Church, and the town water-works steel standpipe rising well above the top of the trees of the heavily wooded hill. The tall chimney of the waterworks pumping house is situated 125 yards (114<sup>m</sup>3) from the lake shore, a few hundred yards west of the harbour. On the high land, about one 45 mile northeast of the harbour, stands Trinity College school showing very conspicuously.

Charts 2070, 2058.

**Port Hope Harbour** consists of an inner basin 420 feet (128<sup>m</sup>0) wide and 640 feet (195<sup>m</sup>1) long, an outer harbour, and an eastern arm 1,400 feet (426<sup>m</sup>7) long and of an average width of 75 feet (22<sup>m</sup>9), into which Ganaraska River empties.

The east pier, irregular in alignment, extending southward from the foot of Mill Street, with the middle pier, forms the east arm, and protects the outer harbour.

The west breakwater, also irregular in shape, converges toward the east pier, leaving a narrow entrance 200 feet (61<sup>m</sup>0) wide. The middle pier separates the east arm from the inner basin. The west breakwater consists of rubble; the wing extending southwesterly from it is in ruins.

**Depths.**—In 1956, the depth in the entrance into the outer harbour, and its approaches was 14 feet (4<sup>m</sup>3). The approach to the western harbour was dredged in 1956, to 12 feet (3<sup>m</sup>7). A depth of 11 feet (3<sup>m</sup>4) can now be carried from the outer harbour into the eastern channel for a distance of 700 feet (213<sup>m</sup>4) inside the southern end of the centre pier. North of this it shoals rapidly.

The channel leading to the inner harbour has a depth of 12 feet (3<sup>m</sup>7) with from 6 to 11 feet (1<sup>m</sup>8 to 3<sup>m</sup>4) in the inner harbour. The west part of the outer harbour is shallow.

Ice forms about December 1 and breaks up the latter part of March.

**Light.**—A light is exhibited, at an elevation of 30 feet (9<sup>m</sup>1), from a skeleton tower on the outer end of the east pier.

**Caution.**—Port Hope Harbour is subject to constant silting, so that the charted depths cannot be relied upon.

Chart 2058.

**Magnetic disturbance.**—At Port Hope, a small area close to the shore has a variation of 12° W., the normal variation for that vicinity being from 8° to 9° W. (see page xxvi).

A small shoal, with 7 feet (2<sup>m</sup>1) of water over boulders, lies one-third of a mile offshore two-thirds of a mile westward of Port Hope light.

**Otty Point**, (Lat. 43° 56' N. Long. 78° 21' W.), with a bank 70 feet (21<sup>m</sup>3) high, is situated 3 miles westward of Port Hope. From Port Hope, a clay bank, 20 to 30 feet (6<sup>m</sup>1 to 9<sup>m</sup>1) in height and treeless, skirts the shore closely leaving little or no space for boat landing. At Otty Point, the bank attains the height of 70 feet (21<sup>m</sup>3) and is surmounted by a clump of large trees about one acre in area. The point is insignificant with shallow bights on each side.

The shorebank grades down to a depth of 30 feet (9<sup>m</sup>1) in a distance of two-thirds of a mile seaward.

**Crysler Point**, 15 feet (4<sup>m</sup>6) high, 6½ miles westward of Port Hope, is a slight projection of the shore, with shallow bights on either side. Off the point, the shore bank grades down to 30 feet (9<sup>m</sup>1) in a distance of less than half a mile. In the bight to the eastward, the shorebank increases slightly in width.

From Crysler Point the clay bank, which skirts the sandy shore, leaving a narrow space for boat landing, gradually rises until at a distance of about

## Chart 2058.

one mile from the point, it attains a height of 90 feet (27<sup>m</sup>4). The top of this bank is fringed with trees; its slope is partly covered with trees.

5 At **Bouchette Point** (*Lat. 43° 54' N. Long. 78° 29' W.*), 100 feet (30<sup>m</sup>5) high, the top of the bank is cultivated and treeless. At this point, the shore bends slightly inward toward Newcastle Harbour, 4½ miles westward.

A large boulder, in 10 feet (3<sup>m</sup>0) of water, with a least depth of one foot (0<sup>m</sup>3) over it, lies 200 yards (182<sup>m</sup>9) offshore, 1½ miles eastward of Bouchette Point.

10 **Port Granby**, a small village one-quarter of a mile inland, is not visible from the lake. It is situated in a depression of the land on the west side of a creek discharging its waters into Lake Ontario, one mile eastward of Bouchette Point.

15 **Coast.**—A few hundred yards west of Bouchette Point, the clay bank, after rapidly receding back at the outlet of a creek, again skirts the shore closely, leaving little or no space for boat landing. The top of the bank, which for a distance of 2½ miles is uniformly 80 feet (24<sup>m</sup>4) high, is covered with trees for a short distance inland. At **Bond Head**, the top of the 50-foot (15<sup>m</sup>2) bank is cultivated. Westward, the bank gradually diminishes in height toward Newcastle Harbour, three-quarters of a mile distant.

20 **Newcastle**, a village in Durham County, is a station on the main lines of the Canadian Pacific and the Canadian National Railways between Montreal and Toronto. It is situated 1½ miles northward of the harbour of the same name. Two of its church steeples are visible from the offing.

25 **Newcastle Harbour.**—The piers are no longer in a state of repair, the channel has filled in and vessels are advised not to attempt the entrance; the harbour as such has been abandoned for some years.

A small patch of boulders, with 9 feet (2<sup>m</sup>7) least water upon it, lies 2¾ cables 203° from the entrance of the harbour.

30 From Newcastle Harbour to Port Darlington, nearly 4 miles westward, the usual clay bank 10 to 40 feet (3<sup>m</sup>0 to 12<sup>m</sup>2) high skirts the shore closely. Toward the latter harbour, the shorebank lessens in width.

35 **Port Darlington.**—The harbour, now in ruins, at the outlet of Bowmanville Creek, consisted of two parallel piers 150 feet (45<sup>m</sup>7) apart, both extending 1,150 feet (350<sup>m</sup>5) southward. In 1950, the channel between the piers was dredged to a depth of 6 feet (1<sup>m</sup>8) for a width of 40 feet (12<sup>m</sup>2) westward of the east pier. The depth in mid-channel between the piers was 2½ feet (0<sup>m</sup>7).

40 **Buoy.**—A red spar buoy, with a reflector band, is moored about 50 feet (15<sup>m</sup>2) southward of the sunken crib on the east side of the channel into Port Darlington harbour.

Port Darlington can be picked up from the offing by several summer cottages built on the sand beach on the west side of the harbour, and also those on the top of the bank on the east side.

45 A mile east of Port Darlington, and close to the shore, are the towers of a radio broadcasting station.

**Bowmanville**, a town in Durham County, is situated nearly 2 miles northward of Port Darlington Harbour. In 1956, it had a population of 6,544. It is a station on the Canadian Pacific Railway. A little over half a mile north-

## Chart 2058.

ward of the harbour, the Canadian National Railways has a station of the same name. Two of the town church steeples are visible from the lake.

**Coast.**—From Port Darlington to **Raby Head**,  $2\frac{1}{4}$  miles southwestward, the coast is low, sandy and gravelly, except at a nameless point one mile southwestward of Port Darlington, where there is a bank, 20 feet ( $16^m1$ ) high, skirting the shore closely for a short distance, and also at Raby Head, where a clay bank rises abruptly to a height of 105 feet ( $32^m0$ ) above the lake, with no landing space between it and the shore. Raby Head is very conspicuous. The shorebank along this coast is half a mile in width.

At Raby Head (*Lat.  $43^{\circ} 52' N.$  Long.  $78^{\circ} 43' W.$* ) the shore makes a slight bend inward; it then trends westward for a distance of  $5\frac{1}{2}$  miles to Oshawa Harbour. The clay bank, varying between 25 and 80 feet ( $7^m6$  and  $24^m4$ ) in height, skirts the shore closely without landing space for a distance of 3 miles. The coast then changes its character to that of a low gravelly beach backed by low swampy land with some open water.

The shorebank along this coast is nearly three-quarters of a mile wide, except off Oshawa Harbour, where it is half a mile in width. Shoals under 6 feet ( $1^m8$ ) extend out one-third of a mile from the low point situated  $1\frac{1}{4}$  miles eastward of Oshawa Harbour.

**Danger area.**—The following area has been reserved by the Royal Canadian Air Force as a practice bombing and firing range:—

From a position,  $174^{\circ}$  Oshawa west pier  $2\frac{1}{2}$  miles, the area is enclosed by a line extending  $080^{\circ}$ , for 51 miles; thence  $170^{\circ}$ , for 14 miles; thence  $262^{\circ}$ , for 51 miles; thence in a  $349\frac{3}{4}^{\circ}$  direction, for  $12\frac{1}{2}$  miles to the point of beginning.

The northern boundary is marked at each end by a can buoy and the interval by 49 spar buoys, moored approximately one mile apart. All buoys are painted International Orange in colour.

**Oshawa Harbour**, 5 miles westward of Raby Head, consists of an artificial basin reached by a channel dredged between two breakwaters. The east breakwater extends into the lake for 1,000 feet ( $304^m8$ ), with a projection westerly having a face 70 feet ( $21^m3$ ) in length. The west breakwater is also about 1,000 feet ( $304^m8$ ) in length.

Wharfage space extends for 500 feet ( $152^m4$ ) along inner part of the west pier. On the south side of the turning basin, there is a revetment wall 500 feet ( $152^m4$ ) long, and on the west side a similar wall, 1,125 feet ( $342^m9$ ) long. The area behind the latter wall is used for coal storage.

The wharves can be located from the offing by the coal sheds and buildings along the harbour, and the summer cottages and pavilion to the westward which show up well. Half a mile west of the wharves, the shore is conspicuous, being 65 feet ( $19^m8$ ) in height. An electric railway connects the harbour with the city of Oshawa, situated  $2\frac{1}{2}$  miles inland.

**Leading lights.**—Leading lights are shown from the west breakwater. The front light is exhibited, at an elevation of 40 feet ( $12^m2$ ), from a skeleton, steel tower, situated on the outer end of the west breakwater. The rear light is exhibited, at an elevation of 56 feet ( $17^m1$ ), from a skeleton, steel tower, situated 1,050 feet ( $320^m0$ ),  $328^{\circ}$  from the front light.

**Buoys.**—A red spar buoy marks the northeastern edge of the turning basin.

*Chart 2058.*

Two red spar buoys and a black spar buoy mark the channel into the turning basin.

5 A red spar buoy is moored about 1.4 miles southeastward of the outer leading light. It marks the southern side of a shoal.

**Depths.**—In 1956, the least depth in the approach channel and inner basin was  $20\frac{1}{2}$  feet ( $6^{\text{m}}3$ ).

10 **Oshawa** is an industrial city, having a population of 50,412, in 1956. It is well served with transportation routes, being a station on the Canadian National Railways and Canadian Pacific Railway, and being supplied with bus and truck service via the public highways.

Along the beach on the west side of the harbour entrance is **Lakeview Park** and summer cottages.

15 **Coast.**—From Oshawa Harbour to Port Whitby,  $5\frac{1}{4}$  miles westward, the coast has no conspicuous features. A bank, which at **Gold Point** is 20 feet ( $6^{\text{m}}1$ ) high and at **Ross Point** 15 feet ( $4^{\text{m}}6$ ), skirts the shore closely. The former is situated 3 miles eastward, and the latter  $1\frac{1}{3}$  miles eastward of Port Whitby; both points have outlying boulders extending 200 yards ( $182^{\text{m}}9$ ) out. The shorebank along this coast is half a mile wide.

20 *Charts 2070, 2062.*

25 **Port Whitby** can be picked up from the offing by the tall, brick chimney of the waterworks pumping house on the gravel beach 150 yards ( $137^{\text{m}}2$ ) eastward of the harbour, and a row of summer cottages extending eastward halfway to Ross Point. The Ontario Mental hospital, situated on the high land near the lake shore west of the harbour, with its buildings covering several acres of land, is very conspicuous. A spur of the Canadian National Railways runs from Whitby Junction to the wharves at Port Whitby.

30 The harbour is situated in the southeast corner of a shallow bay, triangular in shape, with its apex pointing northward. The bay is half a mile long and half a mile wide. It was originally only partly protected by a sandbar. A breakwater has been constructed eastward from the east end of the bar to within 260 feet ( $79^{\text{m}}2$ ) of the southeast corner of the bay, thus giving the harbour entire protection from the force of storms. The west pier extends south 650 feet ( $198^{\text{m}}1$ ) from the east end of the breakwater. The east pier is only 395 feet ( $120^{\text{m}}4$ ) long and is parallel to the west pier.

35 The harbour front consisted of 1,500 feet ( $457^{\text{m}}2$ ) of wharves, on which were built a warehouse and coal sheds.

40 In 1957, in the entrance channel 150 feet ( $45^{\text{m}}7$ ) wide, there was a limiting depth of 14 feet ( $4^{\text{m}}3$ ); there is a depth of 13 feet ( $4^{\text{m}}0$ ) at the inner wharf. Depths are subject to silting.

The Regent Refining Co. has several large oil storage tanks on the northwestern part of the wharf. Oil and ore are imported.

**Buoys.**—The dredged channel is marked by four black and two red spar buoys.

45 **Light.**—A light is exhibited, at an elevation of 37 feet ( $11^{\text{m}}3$ ), from a white, octagonal tower near the outer end of the west pier at Port Whitby.

Chart 2070, 2062.

**Whitby**, a town in Ontario County, had, in 1956, a population of 9,995. It is situated  $1\frac{3}{4}$  miles northward of the harbour. Whitby is a station on the main line of the Canadian Pacific Railway.

The village of **Whitby Junction**, a station on the Canadian National Railways, is situated half a mile northward of Port Whitby. 5

**Coast.**—From Whitby, the shore trends southwestward 3 miles to Richardson Point (*Lat.  $43^{\circ} 50' N.$  Long.  $78^{\circ} 59' W.$* ). At the point, and on its east side, a bank, 20 to 30 feet ( $6^{\text{m}}1$  to  $9^{\text{m}}1$ ) high, skirts the shore closely. The shorebank along this coast is from two-thirds to one-half mile in width. 10 Just west of the point is **Pickering Beach** and summer cottages.

From Richardson Point to **Moore Point**, 4 miles westward, there are two slight projections of the shore, both with a clay bank 50 feet ( $15^{\text{m}}2$ ) high, skirting the shore closely. The shorebank along this coast is about half a mile wide. At Moore Point, which is situated  $1\frac{1}{4}$  miles eastward of Frenchman Bay, 15 a 35-foot ( $10^{\text{m}}7$ ) bank skirts the shore closely. Off the point, the shorebank is three-quarters of a mile wide. On it is a depth of 8 feet ( $2^{\text{m}}4$ ), one-quarter of a mile offshore.

One-third of a mile behind the point, there is a small hill 80 feet ( $24^{\text{m}}4$ ) high on which is situated a large, conspicuous barn. 20

**Duffin Creek** flows into the lake a mile east of Moore Point.

**Frenchman Bay**, half a mile in length and three-quarters of a mile in width east and west, is entirely protected from the force of storms by a narrow sandbar stretching across its mouth.

The entrance of the bay is between two parallel piers 630 feet ( $192^{\text{m}}0$ ) long and 100 feet ( $30^{\text{m}}5$ ) apart. Formerly a channel, dredged to a depth of from 7 to 9 feet ( $2^{\text{m}}1$  to  $2^{\text{m}}7$ ), led between the piers, but this has not been maintained in recent years. The depth in 1947 was 2 feet ( $0^{\text{m}}6$ ). The harbour is privately owned. 25

**Buoys.**—A red spar buoy, with reflector band, is moored close southward of the sunken pier on the eastern side of the entrance channel, and a black spar buoy, with reflector band, is moored in a similar position on the western side of the entrance channel. 30

**Danger area.**—A Gunnery and Depth Charge Range has been established within the following boundaries: from a point 7 miles,  $180^{\circ}$  from the old light-house on the eastern pier of the entrance to Frenchman Bay the boundary extends 10 miles,  $078^{\circ}$ ; thence 3 miles  $168^{\circ}$ ; thence 10 miles  $258^{\circ}$ ; thence 3 miles  $348^{\circ}$  to the point of beginning. 35

**Coast.**—From Frenchman Bay, the shore, trending southwesterly is nearly straight for a distance of 5 miles to a nameless slight projection of the coast. Westward of the sandbar across the mouth of Frenchman Bay, the usual clay bank, 70 feet ( $21^{\text{m}}3$ ) high, skirts the shore closely for a distance of a little over one mile to the mouth of **Rouge River**. The river empties into Lake Ontario through the gravel beach at its entrance. The sand beach,  $1\frac{1}{4}$  miles long, westward of Rouge River entrance, affords good landing for boats. At the west end of this sand beach, a knoll 120 feet ( $36^{\text{m}}6$ ) high, the top of which is covered with trees, but with a bare slope facing the lake, shows up conspicuously. At Rouge River, the main line of the Canadian National Railways 40 45

*Charts 2070, 2062*

approaches to within 100 yards (91<sup>m</sup>4) of the lake shore and follows it at about that same distance for 2 miles westward.

5 **Port Union**, 15 miles northeast of Toronto, is a station of the Canadian National Railways. It is situated close to the lake shore, half a mile southwestward of the above described conspicuous knoll. It consists of a watertank, a station, and a few buildings. A mile southwestward from it is the mouth of **Highland Creek**.

10 At the above-mentioned nameless point, 5 miles southwestward of Frenchman Bay, the shore makes a slight bend inward. It then trends southwestward to **Balmy Beach** (East Toronto) 8½ miles distant. From the point 65 feet (19<sup>m</sup>8) in height, the clay bank skirting the shore closely, gradually increases in height; at a distance of 4½ miles it has attained an elevation of 380 feet (115<sup>m</sup>8) and is known as **Scarborough Bluffs**.

*Chart 2062.*

15 **St. Augustine Seminary** with its dome, situated on this highland, is a very conspicuous object. Southwestward of the seminary the clay bank diminishes in height. At Balmy Beach, it is only 30 feet (9<sup>m</sup>1) high. However, the high land, as it recedes from the lake shore, remains at about the same height.

20 Five and a half miles northeastward of Balmy Beach the shorebank is nearly one mile wide; at the beach it is half that width.

From Balmy Beach, 4½ miles northeastward of Toronto Harbour east entrance, the coast eastward consists of a low sandy beach.

*Charts 2065, 2062.*

25 **Coatsworth Cut** leads into **Ashbridge Bay**, a small shallow inlet. It is situated 2½ miles eastward of the eastern entrance to Toronto Harbour. There is a depth of 2 to 4 feet (0<sup>m</sup>6 to 1<sup>m</sup>2) in the cut. The Ashbridge Bay Yacht Club is situated on the eastern side of the cut.

30 **Toronto** is the Capital of the Province of Ontario. In 1956, Greater Toronto had a population of 1,304,363. The city, the most important shipping centre on Lake Ontario, is built on the gradually rising land which attains a height of 375 feet (114<sup>m</sup>3) at a distance of 3 miles from the harbour front. It is the railroad centre of the province. The Canadian National and Canadian Pacific Railways have numerous branch lines to the important points not situated on their main lines. Steamship lines operate regular freight services to and from all Great Lakes ports, and since the opening of the Welland Ship

35 Canal many of the largest freighters have made Toronto a port of call.

In the daytime, Toronto may easily be picked up from the offing, by the clouds of smoke usually rising and settling over the city; at night by the reflection of the city lights on the sky.

40 Conspicuous marks are the tower of the Provincial Parliament Buildings, about 1½ miles north of the waterfront; the steeples of St. James, and St. Michael's Cathedrals and St. Mary's church; the city hall square tower with its dial clock (lighted); the Royal Bank and the Canadian Pacific Railway buildings, both showing white. Among the skyscrapers, the most prominent are the Royal York hotel, the Canadian Bank of Commerce and the Toronto Daily

45 Star buildings. The first two mentioned are illuminated at night by flood lights directed on the towers surmounting the buildings. These churches and buildings are situated in the central part of the city, fairly close to the harbour front. About 1½ miles north of the harbour, on Yonge Street, a high building shows a revolving white light, intended for the use of aircraft. The beam of light is 50 visible for several miles.

Charts 2065, 2062.

The Custom-house is situated at the corner of Yonge and Front Streets, one block east of the Union Station.

**Harbour.**—The harbour is formed by a low island, formerly a peninsula, about 4 miles long, sheltering a circular bay of about  $2\frac{1}{2}$  square miles, with capacity for a large number of vessels. The northern side of the main island is broken up into many small islands, the principal island being: Algonquin 5 Snake, R.C.Y.C. Islands, Olympic, Forestry and Muggs. There are several yacht clubs, bathing beaches, parks and many homes on the islands. Numerous ferries connect the islands with the mainland. At the northwest end of the main 10 island, adjoining Western Gap, is the Toronto Island Airport (Port George VI). The general depth of the harbour is 23 feet (7<sup>m</sup>0). There are two entrances from the lake, one at the west end and other at the east end of the harbour.

The port can accommodate with safety the largest ships operating on the 15 Great Lakes. Throughout the winter the ice in the harbour is kept broken by tugs permitting movement of ships from berth to berth. There are ample towing facilities at the port, tugs being always available, but they are not necessary for handling ships under normal conditions. All kinds of supplies are available at the port. Water is obtained from the lake or from water-mains 20 on the docks; bunker coal is stored in large quantities and fuel and Diesel oil are stored and delivered through dock pipelines. Coal is loaded at three fuelling docks in the ship channel, with a maximum delivery rate of 60 tons per hour.

The harbour is divided into three sections, namely, Western, Central, and 25 Eastern with the bulk of the industrial development being in the Central and 26 Eastern sections. In the Eastern section are located oil refineries, oil tanks, coal storage yards, and numerous factory buildings which are served by 30 miles of railways leads and sidings. In the Central district, extending 2 miles along the waterfront, are complete passenger and freight steamship terminals with modern concrete piers and slips, served by 10 miles of railway leads and 35 sidings. The Western section, extending 4 miles to the Humber River, is mainly non-industrial.

**Harbour limits.**—The harbour, as defined by Act of Parliament, includes 35 all the waters west of a line drawn due south astronomically one statute mile from the point where the east limit of the city intersects the water's edge of Lake Ontario at high water; east of a line drawn due south astronomically one mile from a point where a line drawn due south astronomically one mile from the west limit of the city on the Lake Shore road intersects the water's edge of Lake Ontario at high water; and north of lines drawn from the southern extremities of said two lines, through a point one statute mile due south astronomically from Gibraltar Point lighthouse, together with the dock and other waterfront property and water lots within city limits; also the docks, shore, 40 and beaches of the island and peninsula.

**Harbour improvements.**—The harbour is under the control of Harbour 45 Commissioners. An extensive scheme of improvements to provide ample harbour accommodation and facilities along the Toronto lake front has been carried out and comprises the following main features:—

*Charts 2065, 2062.*

From the outer end of the north pier of the western entrance, a breakwater, composed of timber crib substructure and concrete superstructure, parallels the shore at a distance of about 350 feet (106<sup>m</sup>7) and extends westerly nearly 4 miles 5 to the Humber River.

The east end of the harbour formerly known as Ashbridge Bay, is now an industrial district, through which runs the ship channel 6,800 feet (2,072<sup>m</sup>6) long and 400 feet (121<sup>m</sup>9) wide, terminating in a turning basin 1,100 feet (335<sup>m</sup>3) square; the channel and basin have depths ranging from 20 to 25 feet (6<sup>m</sup>1 to 10 7<sup>m</sup>6). Concrete wharf walls extend the full length of both sides of the ship channel and all sides of the turning basin.

**Eastern entrance.**—The eastern entrance to the harbour, called **Eastern Gap**, can readily be picked up from the offing in the daytime, by the two high steel electric-power transmission towers situated on the sand beach, one on each 15 side, near the entrance piers. It consists of two parallel piers 2,550 feet (777<sup>m</sup>2) long, 400 feet (121<sup>m</sup>9) apart. The piers are built across a narrow part of the island in the southeast corner of the harbour; they extend 1,250 feet (381<sup>m</sup>0) southeastward into the lake and 700 feet (213<sup>m</sup>4) northwestward into the harbour.

20 In 1957, a least depth of 16 feet (4<sup>m</sup>9) was to be found in Eastern Gap. However, as the channel is subject to constant silting, the depths in the channel should be ascertained before entering. Vessels must not exceed a speed of 6 miles per hour, when passing through Eastern Gap.

**Lights.**—**Leading lights.**—**Fog signals.**—**Radiobeacon.**—A light is 25 exhibited, at an elevation of 66 feet (20<sup>m</sup>1), from a white, hexagonal, stone tower, on **Gibraltar Point**, near the southern end of Centre Island.

A radiobeacon is situated on Gibraltar Point.

A light is exhibited, at an elevation of 27 feet (8<sup>m</sup>2), from a white, square tower on the inner end of the east pier at Eastern Gap. This light is not visible 30 from seaward.

A fog bell is sounded at this light.

Leading lights are shown at Eastern Gap. The front light is exhibited, at an elevation of 43 feet (13<sup>m</sup>1), from a white, square tower near the outer end 35 of the east pier; the rear light is exhibited, at an elevation of 69 feet (21<sup>m</sup>0), from an electric transmission tower, situated 1,765 feet (533<sup>m</sup>0), 323° from the front light.

A bell and a diaphone are sounded from the outer end of the east pier.

A spotlight illuminates the outer end of the west pier.

**Beacon.**—A mast, 25 feet (7<sup>m</sup>6) high, surmounted by a small, white, 40 diamond-shaped daymark, stands near the outer end of the west pier.

**Life-saving stations.**—The main station is located on the north side of the harbour at the foot of Rees Street and is in continuous operation. Substations are maintained during the summer months at various points on the waterfront.

45 The course and distance from one mile southeast of the outer light of the eastern entrance is: to Cobourg, 249°, 62 miles; to Proctor Point, 254°, 83 miles; to Point Petre, 263°, 110 miles; to Oswego 274°, 142 miles; to Niagara Bar light-buoy, 329°, 24 miles; and to Port Weller, 167°, 25 miles.

## Charts 2065, 2062.

Off the east entrance, the shorebank is a little over one mile wide. It keeps the same width for a distance of one mile southwestward, then gradually diminishes in width toward Gibraltar Point where the deep water is less than 400 yards (365<sup>m</sup>8) out. Two hundred yards (182<sup>m</sup>9) out from a point, one mile southwestward of the east entrance, there are depths of 6 feet (1<sup>m</sup>8). A shallow sandbank extends 250 yards (228<sup>m</sup>6) southward and 350 yards (320<sup>m</sup>0) westward from Gibraltar Point.

**Buoys.**—Two spar buoys, marking the seaward end of water intake pipes are moored 2,920 feet (890<sup>m</sup>0), 194°, and 3,020 feet (920<sup>m</sup>5), 153½° respectively, 10 from Gibraltar Point light-tower.

**Light-buoy.**—A red light-buoy, showing a *flashing white* light, is moored about 6 cables southwestward of Gibraltar Point light.

From Gibraltar Point, the shore trends northward to the west entrance of the harbour 1½ miles distant. The shorebank in the line of the west entrance 15 leading light is nearly one mile wide.

**Western Gap.**—This, the main entrance to Toronto Harbour, has a width between piers of 400 feet (121<sup>m</sup>9). It is dredged to a least depth of 24 feet (7<sup>m</sup>3) over a width of 200 feet (61<sup>m</sup>0), and the limits of the dredged channel are marked by buoys. A breakwater extends 1,200 feet (365<sup>m</sup>8) into the 20 lake from the outer end of the south entrance pier. The breakwater is in a poor state of repair.

Annual maintenance is necessary to maintain the channel depth.

A public utilities tunnel crosses the entrance near the eastern end.

From the outer end of the northern pier, a breakwater, with numerous 25 openings for small craft, parallels the shore, at a distance of 350 feet (106<sup>m</sup>7), and extends westward for nearly 4 miles to the Humber River.

Low-powered *flashing red* and *green* lights mark the first opening west of the northern pier and also two openings further westward. These lights are for the guidance of small craft and should not be confused with other navigation 30 lights.

**Light-buoys.**—A red light-and-bell-buoy, showing a *quick-flashing green* light, is moored on the prolonged centre line of the dredged channel, about 9½ cables southwestward of the front leading light, and marks the turning point in the lake approach to the channel.

A red light-buoy, showing a *flashing red* light, is moored close to the outer end of the breakwater.

A black light-buoy, showing a *flashing white* light, is moored about 1,100 feet (335<sup>m</sup>3), 249° from the front leading light.

A red light-buoy, showing a *flashing red* light, fitted with a radar reflector, 40 is moored about 600 feet (182<sup>m</sup>9), 245½° from the front leading light.

A red light-buoy, showing a *flashing red* light, is moored close northeastward of the inner end of the south pier.

**Leading lights.—Fog signal.**—Leading lights are shown at Western Gap. The front light is exhibited, at an elevation of 43 feet (13<sup>m</sup>1), from a white, skeleton tower surmounted by a square lantern, from the outer end of the south pier: the rear light is exhibited, at an elevation of 65 feet (19<sup>m</sup>8), from a red, square, skeleton tower on the inner end of the south pier, 053½° from the front light.

## Charts 2065, 2062.

A fog signal is sounded at the front light, and a hand fog signal is operated in event of failure of the main signal.

**Cable Ferry.—Signals.**—A cable ferry operates near the eastern end 5 of Western Gap, to and from Toronto Island Airport. Vessels should navigate with caution and not drag anchors in this vicinity. The signal from an approaching vessel shall be one long blast of the whistle. The ferry whistle sounds the same signal in return, if the channel is clear; if not, three short blasts of the ferry whistle will be sounded. All vessels must note the light 10 signals on the north and south sides of the channel at the ferry crossing. Each signal consists of two neon lighted surfaces, two feet square, one illuminated red and the other white. When illuminated with the white above the red, the channel is clear for navigation. When the red is above the white, all navigation must cease until the all-clear signal shows.

15 In addition, a railroad semaphore is operated on each side of the channel; when the arm is in a vertical position, with a *green* light showing, the channel is clear for navigation, and when the arm is horizontal, with a *red* light showing, navigation must cease until the all-clear signal shows.

**Directions.**—Vessels from eastward, bound for the west entrance to 20 Toronto Harbour, should hold their course until they are at least one mile west of Gibraltar Point. The *flashing green* light immediately below the front leading light of the entrance should then be seen in a northeasterly direction. Head for the *quick-flashing green* light-and-bell-buoy moored on the prolonged 25 centre line of the dredged channel and 200 feet (61<sup>m</sup>0) north of the range, about one mile out from the piers, round it to starboard, and come on the alignment of the lights.

**Hanlans Point**, on which there is a park, is situated on the south side of the harbour, near the west entrance. Ferry boats run to it at frequent regular intervals.

30 **Royal Canadian Yacht and Queen City Yacht Clubs** are situated on the south side of the harbour, between the east and the west entrances. A private ferry boat, for the use of the R.C.Y.C., runs from the foot of York St. The club has restricted mooring grounds.

## Wharves

## CENTRAL SECTION

Name	Location	Length in feet	Depth in feet
Canada Malting Co. Ltd.....	North of Western Channel.....	350	18
Harbour Brick Co. Ltd.....	North of Western Channel.....	310	14
Loblaw Grocerterias Co. Ltd.....	N.W. Corner of Harbour.....	600	10
Gov't. of Canada—Army Ordnance.....	N.W. Corner of Harbour.....	212	10
Northern Power and Industrial Pipe.....	West of Spadina Ave. Slip.....	168	10
International Realty Co. Ltd.....	West Side of Spadina Ave. Slip.....	880	10-16
Toronto Elevators Ltd.....	East Side of Spadina Ave. Slip.....	500	8
Toronto Elevators Ltd.....	Harbourhead Wall.....	385	19
Toronto Elevators Ltd.....	West Side of Peter St. Slip.....	538	20
Toronto Elevators Ltd.....	East Side of Peter St. Slip.....	557	22
Toronto Elevators Ltd.....	Harbourhead Wall.....	329	20
Metro Toronto Marine Yard.....	John St. Slip.....	1,150	18
T.H.C. Marine Terminal No. 4.....	West Side of Simcoe St. Slip.....	650	20
Terminal Warehouses Ltd.....	East Side of Simcoe St. Slip (Shed No. 5)	540	20-22
Terminal Warehouses Ltd.....	Harbourhead Wall.....	1,085	20-22
Terminal Warehouses Ltd.....	West Side of York St. Slip.....	645	20-22
T.H.C. Marine Terminal No. 6 (C.S.L.)	East Side of York St. Slip.....	750	20
Canada Steamship Lines—Pier No. 7....	West Side of Bay St. Slip.....	745	18-20

Charts 2065, 2062.

## Wharves—Concluded

CENTRAL SECTION (concl'd)

Name	Location	Length in feet	Depth in feet
Canada Steamship Lines—Pier No. 8.....	East Side of Bay St. Slip.....	614	18-20
Canada Steamship Lines.....	Harbourhead Wall.....	550	18-20
Canada Steamship Lines—Pier No. 9.....	West Side of Yonge St. Slip.....	600	18-20
Eastern Canada Stevedoring—Pier No. 10.....	East Side of Yonge St. Slip.....	300	26
T.H.C. Marine Terminal No. 11.....	East Side of Yonge St. Slip and Harbourhead Wall.....	1,060	26
Canada Dominion Sugar Co.....	West Side of Jarvis St. Slip and Harbourhead Wall.....	1,320	26
T.H.C.—Vacant.....	East Side of Jarvis St. Slip.....	509	26
T.H.C.—Vacant.....	Harbourhead Wall.....	2,152	26
T.H.C.—Vacant.....	West Side of Parliament St. Slip.....	458	26
Gooderham & Worts Ltd.....	West Side of Parliament St. Slip.....	227	17
EASTERN SECTION			
Victory Soya Mills Ltd.....	East Side of Parliament St. Slip.....	688	18
Victory Soya Mills Ltd.....	North Side—Keating Channel.....	315	16-17
Dominion Malting Ltd.....	North Side—Keating Channel.....	285	16-17
National Iron Ltd.....	North Side—Keating Channel.....	870	16-17
T.H.C. Marine Terminal Nos. 19 and 20.....	North Side—Keating Channel.....	650	15
British American Oil.....	North Side—Keating Channel.....	600	15
Gordon Young Limited.....	North Side—Keating Channel.....	150	15
Toronto Dry Dock Co.....	South Side—Keating Channel.....	500	12
Russell Construction Co.....	South Side—Keating Channel.....	720	12
T.H.C. Construction Yard.....	South Side—Keating Channel.....	780	12
Canada West Indies Molasses.....	South Side—Keating Channel.....	290	15
Lake Ont. Portland Cement.....	South Side—Keating Channel.....	390	12
Century Coal Company.....	South Side—Keating Channel.....	1,386	12-18
Elias Rogers Co. (Coal).....	West Side of Cherry St.....	2,300	20
Canadian Oils Limited.....	West Side of Cherry St.....	1,000	20
Canada Coal Ltd.....	West Side of Cherry St.....	500	20
Canada Cement Co.....	North Side of Polson St.....	1,068	20
Toronto Fuels Ltd.....	North Side of Polson St.....	300	20
Gair Company.....	South Side of Polson St.....	1,390	20
Toronto Fuels Ltd.....	North Side of Ship Channel.....	530	20
Industrial Iron and Machinery.....	North Side of Ship Channel.....	1,680	20-21
McColl Frontenac Oil.....	North Side of Ship Channel.....	300	20-21
Superfest Petroleum Corp.....	North Side of Ship Channel.....	748	20-21
Imperial Oils Ltd.....	North Side of Ship Channel.....	250	20-21
Halliday Fuels Ltd.....	North Side of Ship Channel.....	276	20-21
Liquiflame Oils Ltd.....	North Side of Ship Channel.....	256	20-21
Hydro Electric Power Com. of Ont.....	North Side of Ship Channel.....	260	20-21
Sun Oil Co. Ltd.....	North Side of Ship Channel.....	610	20-21
Imperial Oil Ltd.....	North Side of Ship Channel.....	521	20-21
Eastern Canada Stevedoring.....	West Side of Turning Basin.....	384	20
Eastern Canada Stevedoring.....	West Side of Turning Basin.....	350	15
Gair Company.....	North Side of Turning Basin.....	500	15
Shell Oil Co. Ltd.....	North Side of Turning Basin.....	600	20
T.H.C. Public Dock.....	East Side of Turning Basin.....	1,100	20-21
Consumers' Gas Co.....	South Side of Turning Basin.....	1,100	20-21
Hydro Electric Power Com. of Ont.....	South Side of Ship Channel.....	1,455	20-21
Hydro Electric Power Com. of Ont.....	South Side of Ship Channel.....	319	20-21
T.H.C. Vacant.....	South Side of Ship Channel.....	225	20-21
Joy Oil Co.....	South Side of Ship Channel.....	650	20-21
Elias Rogers Co. (Fuel Oil).....	South Side of Ship Channel.....	300	20-21
Canada Coal Ltd.....	South Side of Ship Channel.....	750	20-21
Halliday Fuels Ltd.....	South Side of Ship Channel.....	500	20-21
M.A. Hanna Co.....	South Side of Ship Channel.....	1,000	20-21
F. P. Weaver Coal.....	South Side of Ship Channel.....	2,250	20-21
Liquifuels Ltd.....	South Side of Ship Channel.....	Pipeline	20-21
Consolidated Coal & Dock.....	South Side of Ship Channel.....	320	20
Milnes Fuel Ltd.....	South Side of Ship Channel.....	Pipeline	20-21
Valley Camp Coal Co.....	Southeast Corner of Harbour.....		

**Keating Channel** extends northeastward from the northeast corner of the harbour. It is the artificial outlet of the **Don River**. The channel is 120 feet (36<sup>m</sup>6) wide, 3,000 feet (914<sup>m</sup>4) long, and has a depth of 12 feet (3<sup>m</sup>7). A bascule bridge crosses the channel near its entrance. It is subject to shoaling after freshets in the Don River and requires seasonal dredging. 5

Charts 2065, 2062.

**Bridge signals.**—The signal from a vessel for opening the bridge is two long followed by two short blasts of the whistle; the bridge whistle sounds the same signal in return before opening and two short blasts before closing; if not ready to open, three short blasts are sounded.

**Lights.**—Each abutment of the bridge is marked with a *fixed white* light. A *fixed red* light on the bridge means that it is lowered; a *fixed green* light means that the bridge is raised, and a vessel may proceed.

**Ship Channel and Turning Basin.**—From the southeasterly corner of the harbour, a ship channel, 400 feet (121<sup>m</sup>9) wide and 6,800 feet (2,072<sup>m</sup>6) long, runs easterly through the industrial district, terminating in a turning basin 1,100 feet (335<sup>m</sup>3) square. Concrete walls extend the full length of both sides of the channel and on all sides of the basin. The depths range from 20 to 25 feet (6<sup>m</sup>1 to 7<sup>m</sup>6).

15 A bascule bridge spans the channel, near the entrance. It is lighted in the same way as the bridge over Keating Channel.

High tension power cables cross the Ship Channel near its upper end. The overhead clearance is 150 feet (45<sup>m</sup>7).

**Bridge signals.**—The vessel signal for opening this bridge is one long blast followed by one short and one long blast; the bridge sounds the same signal in return before opening and two short blasts before closing; if not ready to open, three short blasts are sounded.

Most of the berthing space has been leased for private commercial purposes.

25 On the west side of the bridge a submerged 12-inch (0<sup>m</sup>3) water-main crosses the channel at a depth of about 32 feet (9<sup>m</sup>8); on the east side, a Bell Telephone submarine cable crosses at a depth of about 30 feet (9<sup>m</sup>1). Vessels should navigate with caution and not drag anchor at these points.

**Repairs to vessels.**—Extensive repairs may be made to ships by the 30 Toronto Drydock Co., both to hull and machinery.

This company has a floating dock 175 feet (53<sup>m</sup>3) long by 45 feet (13<sup>m</sup>7) wide with lifting capacity of 750 tons, and a repair shop in connection therewith. Several firms are equipped for electric welding of machinery and castings and for installation and repairs of electrical equipment.

35 **Depths in the harbour.**—The 18-foot (5<sup>m</sup>5) contour lies from 500 to 1,200 feet (152<sup>m</sup>4 to 365<sup>m</sup>8) off the south side and within half a mile of the west side. On the north and east sides, the harbour has been dredged to a depth of 24 feet (7<sup>m</sup>3) to enable vessels from the upper lakes to enter and make full use of the harbour.

40 **Traffic.**—In 1956, 5,191 vessels entered and cleared Toronto Harbour, with a net tonnage of 7,776,969 tons. Cargoes unloaded totalled 5,486,912.

## CHAPTER V

### LAKE ONTARIO

#### TORONTO TO HAMILTON

Chart 2062.

**Humber Bay** is an open bight westward of Toronto Harbour, between the exhibition grounds to the east and Mimico to the west. Electric power transmission towers fringe the northeast side of the bay. 5

**Seawall.**—From the Toronto Harbour west entrance breakwater pier for  $3\frac{1}{2}$  miles to the mouth of the Humber River, there extends a concrete seawall parallelling the beach and forming a sheltered aquatic course some two and three hundred yards in width. Good shelter can be had for small craft behind this seawall, through which there are numerous entrances. The main Toronto-Hamilton highway follows this shore and here also are situated the Canadian National Exhibition grounds and waterfront amusement parks. 10

**Humber River.**—The mouth of the river, about 100 feet ( $30^m5$ ) in width, 15 is situated on the northwest side of Humber Bay. It bears  $274^\circ$ , and is distant  $3\frac{1}{2}$  miles, from Toronto Harbour west entrance. The river, near its mouth, is crossed by a fairly low highway bridge, and a short distance farther upstream by a railway bridge. It is navigable for a distance of about 2 miles for small craft. 20

**Transmission towers.**—Close northward of the railway bridge, the river is crossed by overhead power cables, supported by two conspicuous towers, 258 feet ( $78^m6$ ) high. 20

**Mimico.**—This suburb of Toronto is situated on the western side of Humber Bay. A mental hospital, situated a few hundred yards from the lake shore on the west side of the town, shows up conspicuously with its tall brick chimney. It bears  $260^\circ$ , and is distant  $6\frac{1}{2}$  miles, from Gibraltar Point light-house, Toronto. The hospital pump-house, with its fairly tall chimney, is situated nearby, on the lake shore, close to a well protected small wharf, affording good shelter for small craft, three-quarters of a mile eastward of Long 30 Branch wharf. 25

The town pump-house, with its several smokestacks, situated on the lake shore on top of a 15-foot ( $4^m6$ ) bank, half a mile eastward of the mental hospital, shows up fairly conspicuously.

**Long Branch** (*Lat.  $43^\circ 35' N.$ , Long.  $79^\circ 32' W.$* ) is situated  $7\frac{1}{4}$  miles 35 west of Gibraltar Point, Toronto. It has a wharf extending 400 feet ( $121^m9$ ) southeastward into the lake, at the outer part of which the depth is slightly over 6 feet ( $1^m8$ ). The shorebank southwestward of Long Branch is three-quarters of a mile wide, but along the shore northeastward it is about one-third of a mile in width. 40

**Rifle ranges**, known as Long Branch rifle range, are situated close to the lake shore, less than a mile westward of Long Branch, and about  $1\frac{1}{4}$  miles eastward of Port Credit. It has several stop butts, which can be plainly seen

## Chart 2062.

from the offing. The soundings west of Long Branch are irregular and the bottom is rocky, the shore is bordered with shallow water extending as much as one-third of a mile out, and the shorebank as much as one mile.

5      **Danger area.**—A danger area exists between the following boundaries:— Beginning at a point about 3 miles southwest of Mimico, in *Lat. 43° 34' 54" N. Long. 79° 32' 42" W.* the boundary extends 18,600 feet (5,669<sup>m</sup>3), 121 $\frac{1}{2}$ °; thence 13,400 feet (4,084<sup>m</sup>3) 223 $\frac{1}{2}$ °; thence 18,000 feet (5,486<sup>m</sup>4) 323° to a point on the shore.

10     The limits of the area are marked by spar buoys coloured international orange.

**Weather buoy.**—An automatic weather buoy is moored about 2 $\frac{1}{2}$  miles southeastward of Long Branch rifle range, in the following position: *Lat. 43° 33' 00" N. Long. 79° 30' 07" W.*

## 15 Charts 2070, 2063.

**Port Credit**, in Peel County, had a population of 6,350 in 1956. It is situated close to the lake shore at the mouth of the **Credit River**. The two tall chimneys and the water tank of the starch works on the northeast side, and the water tanks and chimneys of an oil company on the southwest side of the 20 mouth of the river, are conspicuous.

In 1955, an entrance channel, 800 feet (243<sup>m</sup>8) long, and 100 feet (30<sup>m</sup>5) wide, and an inner basin, 800 feet (243<sup>m</sup>8) long, and 140 feet (42<sup>m</sup>7), maximum width, had a least depth of 7 feet (2<sup>m</sup>1).

The entrance channel is protected from the north and east by a breakwater, 396 feet (120<sup>m</sup>7) long, called North Pier. On the northern side of the entrance channel, and nearly parallel to it, is an almost submerged breakwater.

At the plant of the Trinidad Leaseholds (Canada) Ltd., situated about one-third of a mile southward of the river mouth, there is a dredged slip about 600 feet (182<sup>m</sup>9) long and 100 feet (30<sup>m</sup>5) wide, and an entrance channel from 30 the lake, with a minimum depth of 11 feet (3<sup>m</sup>4). A breakwater extending from the northern shore for about 400 feet (121<sup>m</sup>9) in a southeasterly direction, protects the entrance channel.

A crib, situated 1,780 feet (542<sup>m</sup>6), 119°, from the outer end of the oil plant breakwater, marks the end of a pipeline from the oil plant. A *flashing red* light, 35 privately maintained, is shown from this crib.

A marine terminal for an oil pipeline is situated 2,080 feet (634<sup>m</sup>0) from the outer end of the same breakwater. A *flashing green* light, privately maintained, is shown from this structure.

**Leading lights.**—Leading lights are shown at Port Credit. The front 40 light is exhibited, at an elevation of 22 feet (6<sup>m</sup>7), from a small, steel tower on the southeastern end of North Pier; the rear light is exhibited, at an elevation of 55 feet (16<sup>m</sup>8), from a lantern on a pole, 1,775 feet (541<sup>m</sup>0), 282° from the front light. The lights in line, bearing 282°, lead to the entrance channel.

**Buoys.**—The eastern end of the submerged breakwater at the entrance to 45 Port Credit is marked by a red spar buoy.

A black spar buoy, showing a *flashing white* light, marks the outer end of a water intake pipe. It is situated about 2,100 feet (640<sup>m</sup>1) eastward of the light on North Pier.

Charts 2070, 2063.

A red spar buoy is moored 1,010 feet (307<sup>m</sup>8), 097°, from the light-tower on North Pier.

A red spar buoy is moored 1,650 feet (502<sup>m</sup>9), 137°, from the outer end of the breakwater at the entrance to the Trinidad Leaseholds oil plant.

**Coast.**—Off Port Credit, the shorebank is three-quarters of a mile wide. From Port Credit, the shore forms a wide open bay, thence, at a point about 3½ miles southward of Port Credit, it makes a bend inward and trends nearly straight for a distance of 5 miles to Oakville. Along the whole of this shore, shallow water extends as far out as 2 cables from the shore. At the point, there is a depth of 7 feet (2<sup>m</sup>1) 3 cables out. Deep water, however, approaches to within three-quarters of a mile of the northeastern part of this shore and within half a mile of the southwestern part.

At **Clarkson Harbour**, about 3½ miles southward of Port Credit, is a British-American Oil Co. Ltd. refinery and jetty. The concrete jetty extends for 1,140 feet (347<sup>m</sup>5) in a 138° direction from the shore; thence in a 158° direction for 738 feet (225<sup>m</sup>0). There is a depth of 23 feet (7<sup>m</sup>0) on both sides of the outer 738 feet (225<sup>m</sup>0) of the jetty. Facilities are provided for discharging ballast water ashore, but tank cleaning is not permitted. A 259-foot (78<sup>m</sup>9) concrete smokestack at the refinery, marked at night by *fixed red* lights, is a prominent landmark.

The lake bottom in the vicinity is shelving shale rock and the use of anchors is impracticable.

**Lights.**—**Fog signal.**—Leading lights are shown from the outer portion of the jetty. The front light is exhibited, at a height of 30 feet (9<sup>m</sup>1), near the outer end of the jetty. The rear light is exhibited, at a height of 38 feet (11<sup>m</sup>6), 730 feet (222<sup>m</sup>5), 338° from the front light.

A *fixed red* light is exhibited, at a height of 11 feet (3<sup>m</sup>4), from the outer end of the jetty.

A fog whistle is sounded, when a ship is expected, at the outer end of the jetty.

The above lights and fog signal are privately maintained.

One mile southwestward of the above wharf are situated the plant, with a conspicuous chimney, and wharf of the St. Lawrence Cement Co. A causeway, 100 feet (30<sup>m</sup>5) wide and 1,200 feet (365<sup>m</sup>8) long, leads to a wharf 1,500 feet (457<sup>m</sup>2) long, varying in width from 67 feet (20<sup>m</sup>4) at the inner end to 220 feet (67<sup>m</sup>1) at the outer end. On the western side of the outer end are two conspicuous loading towers, each about 80 feet (24<sup>m</sup>4) high. The towers have a combined capacity of 1,000 tons of cement. The wharf can berth vessels of up to 27-foot (8<sup>m</sup>2) draught. Powdered coal is discharged at the wharf and a conveyor belt for the discharge of limestone is projected.

**Oakville**, a residential town in Halton County, is situated close to the lake shore at the mouth of **Oakville Creek**, 18½ miles southwestward of the west entrance of Toronto Harbour, and 11½ miles northeastward of the entrance of Hamilton Harbour. In 1956, it had a population of 9,983. Its conspicuous marks are two church steeples and a steel water standpipe, all showing well above the top of the trees. It is a station on the Canadian National Railways.

**Harbour.**—The entrance of the harbour is between two piers. The northeastern pier, 740 feet (225<sup>m</sup>6) in length, extends out into the lake, in a south-easterly direction, 100 feet (30<sup>m</sup>5) beyond the outer end of the southwestern pier.

## Charts 2070, 2063.

The southwestern pier is irregular in shape; at its outer end, the width between the piers is 120 feet ( $36^m6$ ); inward it is slightly less.

In 1954, the channel at the entrance to and inside the piers had a least 5 depth of 11 feet ( $3^m4$ ).

**Buoys.**—The entrance of the dredged channel to the harbour is marked by a red spar buoy moored on the east side of the channel 560 feet ( $170^m7$ ),  $143^\circ$  from the lighthouse on the east pier, and by a black spar on the west side of the channel 580 feet ( $176^m8$ ),  $157^\circ$  from the same light.

10 **Light.**—A light is exhibited, at an elevation of 39 feet ( $11^m9$ ), from a white, hexagonal tower with a red lantern, on the outer end of the northeastern pier at Oakville.

## Chart 2063.

15 From Oakville to Bronte, a distance of  $3\frac{3}{4}$  miles, the shore trending southward is bordered with shallow water extending less than a cable seaward. The five-fathom ( $9^m1$ ) line approaches to within half a mile of this shore.

20 **Bronte**, a village in Halton County, is situated at the mouth of **Bronte Creek**,  $7\frac{2}{3}$  miles northeastward of the entrance of Hamilton Harbour. It is a station on the main line of the Canadian National Railways between Toronto and Hamilton. Its distinctive marks are the tall chimney of a flour mill on the north side of the creek near its mouth, the United church back of the village, and a summer pavilion on the sand beach on the south side of the harbour.

25 **Bronte Harbour** consists of two piers extending eastward into the lake. The piers about 80 feet ( $24^m4$ ) apart, are nearly parallel and curve slightly southward. The channel between the piers had a least depth of 10 feet ( $3^m0$ ) in 1948. In the harbour, there is berthing space of about 700 feet ( $213^m4$ ), with depths of 10 feet ( $3^m0$ ). Above the piers the creek is shallow. The harbour is used mostly as a fishing station.

30 The shallow rocky flats on each side of the harbour extend one-quarter of a mile out. Half a mile southward of the harbour the shorebank is three-quarters of a mile wide.

**Light.**—A light (*Lat.  $43^\circ 24' N.$ , Long.  $79^\circ 42' W.$* ) is exhibited, at an elevation of 35 feet ( $10^m7$ ), from a skeleton, steel tower on the outer end of the north pier at Bronte.

35 **Coast.**—From Bronte to Burlington, a distance of  $7\frac{2}{3}$  miles, the shore, with a bank 20 to 30 feet ( $6^m1$  to  $9^m1$ ) high skirting it closely for most of that distance, trends southwestward. This shore is also bordered with shallow water, which extends one to two cables out. The shorebank defined by the 5-fathom ( $9^m1$ ) line is three-quarters of a mile in width near Bronte, but does not attain 40 a greater width than half a mile, further westward.

45 **Burlington**, a town in the southwest corner of Halton County, is situated close to the shore  $1\frac{1}{4}$  miles north of Hamilton Harbour entrance. A large building, once used as a soldiers' hospital, situated in the southwestern part of the town, shows up conspicuously. There is a wharf nearby, at which there is about 6 feet ( $1^m8$ ) of water. A breakwater built close to and parallel to the shore along the southern part of the town southwestward of the wharf affords good shelter for small craft.

*Chart 2063.*

Burlington is a station on the main line of the Canadian National Railways between Toronto and Hamilton.

**Mount Nemo**, situated 7 miles northward of Hamilton, and the same distance westward of Bronte, is a hill, which rises more or less abruptly from the high land of that locality. Mount Nemo is 750 feet (228<sup>m</sup>6) above Lake Ontario and is very conspicuous because of its north and west sides being steep for a height of 100 feet (30<sup>m</sup>5) from its summit, which is practically level for about three miles north and south.

**Rattlesnake Point** is the name given to the steep south side of another 10 conspicuous hill, situated three miles northward of Mount Nemo. The hill is 855 feet (260<sup>m</sup>6) high. The sides of the hill, which are visible from the lake, are steep for a height of about 100 feet (30<sup>m</sup>5) from the summit, which is a fairly level plateau extending a couple of miles north and south. The height of land between Rattlesnake Point and the last-mentioned hill is 455 feet 15 (138<sup>m</sup>7).

*Charts 2067, 2063.*

**Hamilton**, an industrial city in Wentworth County, is situated at the west extreme of Lake Ontario. In 1957, it had a population of 239,625. The main part of the city is built on low and fairly level land on the south side of Hamilton Harbour. The residential section of the city extends to the plateaus, which rises abruptly with almost perpendicular walls to a height of 400 feet (121<sup>m</sup>9) above the lake, at an average distance of two miles south of the harbour front. 20

Hamilton is an important railroad point, being served by the Toronto, 25 Hamilton and Buffalo, the Canadian Pacific, and the Canadian National Railways. It is also the centre of a network of highways, which carry a heavy freight and passenger traffic.

The most conspicuous marks are the steel water tank located at the edge of the cliff on the plateau mentioned previously, above the central part of the city; the chimney of the Ontario Hospital to be seen about 1½ miles west of the 30 tank; and the Piggott building, located near the centre of the city. The last is about 20 stories in height, its stone tower being lighted at night by floodlights, and showing a revolving white light. The light is maintained by private interests, as an aid to aircraft.

**Hamilton Harbour.**—This port is under the control of the Harbour 35 Commissioners. The bay, formerly called Burlington Bay, triangular in shape, with the apex pointing northward, is five miles long east and west, and two and one-half miles wide. It has an area of more than six square miles, and for the greater part is from 5 to 12 fathoms (9<sup>m</sup>1 to 21<sup>m</sup>9) deep over a mud bottom. The north side is bold and fairly steep-to, but the south and the northeast sides 40 are low and bordered with wharves and shallow mud flats. Deep water approaches to within 3 cables of the west end of the bay.

**Burlington Canal.**—The harbour and bay are protected from the storms of Lake Ontario by a narrow strip of land, 3 miles long and varying in width from 300 to 1,250 feet (91<sup>m</sup>4 to 381<sup>m</sup>0). On it is situated **Hamilton Beach**, a 45 residential area of Hamilton. Two parallel piers 300 feet (91<sup>m</sup>4) apart and 2,719 feet (828<sup>m</sup>8) in length, mark the entrance to the harbour from Lake Ontario. They extend in a northeasterly direction 1,300 feet (396<sup>m</sup>2) into the lake, and 900 feet (274<sup>m</sup>3) into the bay.

## Charts 2067, 2063.

The passage between the piers is 300 feet (91<sup>m</sup>4) wide throughout with the exception of where bridges cross and the pivot and protection pier divides the channel for a length of 500 feet (152<sup>m</sup>4) with one passage 130 feet (39<sup>m</sup>6)

5 wide on the south side. The approaches from the lake and bay are each about 1,100 feet (335<sup>m</sup>3) long and increase in width, from the end of the piers to deep water, from 300 feet (91<sup>m</sup>4) to 460 feet (140<sup>m</sup>2). In 1956, the channel between the piers had a least depth of 27 feet (8<sup>m</sup>2) and the approaches were somewhat deeper.

10 In the daytime, the entrance can be picked up from the offing by four, tall, steel, transmission towers, two on each side, which are erected on the beach close to each entrance pier. A high, steel, water tank, half a mile southward of the entrance is also a prominent mark.

15 **Light-buoy.**—A light-and-bell-buoy, showing a *flashing green* light, is moored about one mile, 053°, from the outer light on the south pier. The buoy is marked with black and white vertical stripes and equipped with a radar reflector.

20 **Lights.—Fog signals.—Radiobeacon.**—A light is exhibited, at an elevation of 75 feet (22<sup>m</sup>9), from a grey, circular stone tower, with a red lantern, near the middle of the south pier, at the entrance to Hamilton Harbour.

A light is exhibited, at an elevation of 40 feet (12<sup>m</sup>2), from a white, square tower with a red lantern, on the outer end of the south pier. A spotlight illuminates the outer end of the north pier.

A fog signal is sounded at the light and a radiobeacon is operated.

25 The above two lights in line, bearing 234°, lead to the harbour entrance.

A light is exhibited, at an elevation of 20 feet (6<sup>m</sup>1), from a white, square tower, on the inner end of the south pier. The light is not visible from seaward. A spotlight illuminates the inner end of the north pier.

A hand horn answers vessels' signals.

30 **Bridge Signals.**—The following are extracts from the Harbour Regulations:—

3. (1) The Master of every vessel approaching the bridges of the Burlington Channel, and desiring passage through, shall sound *three long blasts* of a whistle or horn to indicate to the bridgemaster that the bridges be opened.

35 (2) The *fixed red* signal lights on the end of the entrance pier and on the end of the central pier, both in the direction of the vessel requiring passage through, shall be changed to *flashing red* to indicate that the channel is being cleared for passage from that direction.

(3) When both bridges are fully open, the *flashing red* signal lights shall 40 be changed to *fixed green* lights, and the vessel may then pass through the Channel.

(4) No liability shall be incurred by the Crown in the event of failure of the bridgemaster or staff to give the signals provided for in subsections two and three.

45 4. (1) No vessel shall enter the Burlington Channel, except in emergency, until the signal lights are *green* from the direction in which passage through is required; in the case of emergency the vessel shall immediately tie up at the north wall and wait until the bridge signal on the central pier is *green* before leaving the north wall to pass through the south passage.

50 (2) The right of way shall be given to vessels inward bound from Lake Ontario.

*Charts 2067, 2063.*

(3) Every vessel, when approaching a bridge which is not in a fully open position, shall be kept at such speed, and under such control, that the vessel may at any time be stopped well clear of the bridge.

**Bridges.**—There are two bridges across the canal. The Canadian National Railways swing-bridge spans the channel, and a bascule bridge and trestle carries the highway over. There is one navigable channel south of the centre pier of the two bridges dividing the canal. 5

**Light-buoy.**—A black light-buoy, showing a *flashing white* light and fitted with a radar reflector, marks the edge of shoal water on the southern side 10 of the western entrance to Burlington Canal.

## Wharves, depths, dock lights

## Charts 2067, 2063.

The following is a more detailed description of the harbour.

**Docks.**—The Dominion Foundries and Steel Ltd. has a dock with a berthing length of 1,264 feet (385<sup>m</sup>3). The facilities include a locomotive crane, two 5 Heyle-Paterson bridges with clams and magnets for discharging coal, ore, limestone, iron and scrap steel; the capacity is 800 tons per hour. The dock is served by railway tracks, but has no sheds. The Canadian Industries Ltd. and oil companies' dock has a berthing length of 400 feet (121<sup>m</sup>9). There are no sheds but the dock is served by railway tracks and is used principally for handling 10 gasoline, oil, sulphur and phosphate rock.

The Canada Steamship Lines dock has a berthing length of 1,200 feet (365<sup>m</sup>8), and a freight shed area of 80,000 square feet and freight handling facilities include fork lift trucks and towing tractors; this dock is not served by railway tracks. The No. 1 dock of the Steel Company of Canada provides a 15 berthing length of 1,500 feet (457<sup>m</sup>2). The handling facilities include three Mead-Morrison bridges with clams and magnets for handling coal, ore, iron and scrap steel, the capacity being 600 tons per hour each; they also include a locomotive crane. There are no sheds on the dock, but it is served with railway tracks. The No. 2 dock of the same company is situated on the western limits 20 of the plant property, and runs in a north-south direction, having a berthing length of 2,000 feet (609<sup>m</sup>6). Two Mead-Morrison bridges with clams and magnets are used for handling coal, ore, iron and scrap steel; they have a capacity of 1,140 tons per hour each. The dock has no sheds and no railway tracks.

The Hamilton Harbour Commission's La Salle Park wharf, situated on the 25 north shore of the bay, is 370 feet (112<sup>m</sup>8) long, and 170 feet (51<sup>m</sup>8) wide. The ferry from the city uses the west side of the wharf; the east side is used for the storage of sand and the handling of cement and building products. The dock is well lighted, but there are no sheds, handling facilities or railway tracks.

Terminal wharf No. 1 of the Hamilton Harbour Commission has a berthing 30 length of 4,113 feet (1,253<sup>m</sup>6) with a depth of 22 feet (6<sup>m</sup>7). The dock surface comprises an area of about 52 acres. The James Street dock of the Harbour Commissioners has a berthing length of 247 feet (75<sup>m</sup>3), with a depth of 15 feet (4<sup>m</sup>6). This dock is for passenger boats only.

The remainder of the south side is made up of boathouses, clubhouses and 35 ruined wharves. A considerable strip of land, about 200 feet (61<sup>m</sup>0) wide, has been reclaimed by the Canadian National Railways along its right of way abreast the old station, and about two-thirds of a mile west from there.

**Repairs.**—There are no dry docks, but there are machine shops capable 40 of making repairs of many classes. The nearest dry dock is at Port Dalhousie. The Harbour Commission's James Street service dock has a marine railway, with a capacity of up to 75 tons and 115 feet (35<sup>m</sup>1) in length.

**Fuel.**—Bunker coal is always available, some 3,000 tons being kept on hand for delivery at the Hamilton By-Product Coke Ovens, Ltd. Fuel oil also is always available, storage of 3,000,000 gallons being maintained; it may be 45 delivered from tank cars from the Harbour Commissioners' dock, Wellington Street, at the rate of one car per hour, or arrangements may be made to pump it from main pump lines to the ship. Diesel oil is also available.

**Communications.**—The port is served by the Canadian National, Canadian Pacific, and Toronto, Hamilton and Buffalo Railways. Many steamship 50 lines operate to and from the port regularly; these include Canada Steamship

*Charts 2067, 2063.*

Lines, Ltd., Tree Line Interprovincial Co., Newfoundland Canada Steamships Ltd., Northwest Transportation Co., and Paterson Steamship, Ltd.

**Pilotage.**—There are no pilotage requirements.

**Buoys.—Leading lights.**—The channel to the dock of the Dominion Foundries and Steel Ltd. is marked by two red light-buoys, showing *flashing red* lights, one black light-buoy, showing a *flashing white* light and two black spar buoys. The eastern limit of the dredged turning basin is marked by two black spar buoys. All outer *flashing* buoys in the harbour are equipped with radar reflectors.

The channel to the pier of the Hamilton By-Products Coke Ovens Ltd. is marked by two red light-buoys, showing *flashing red* lights, one black light-buoy, showing a *flashing white* light and one black spar buoy.

The channel from the northeastward leading to the No. 1 dock of the Steel Co. is marked by two red light-buoys, showing *flashing red* lights, one black light-buoy, showing a *flashing white* light and one black spar buoy; the limit of the dredged area north of the dock is marked by a red spar buoy, and the channel to the westward is marked by a red light-buoy, showing a *flashing red* light.

The channel from the northward leading to the No. 2 dock of the Steel Co. and to The International Harvester's piers, is marked by two red spar buoys. The limit of the dredged area north of the International Harvester's twine mill wharf is marked by one black spar buoy.

The channel to the Canada Steamships wharf is marked by one black light-buoy, showing a *flashing white* light, and four black spar buoys. All spar buoys in the harbour are fitted with red or white reflectors.

The channel leading to the Wellington Street wharf is marked by a red light-buoy, showing a *flashing red* light.

*Flashing white* leading lights mark the east side of the channel to the Steel Co. No. 2 and International Harvester's wharves from the northward.

**Desjardins Canal.**—The entrance to this canal is through a cut, in the narrow ridge of land 105 feet (32<sup>m</sup>0) in height, known as Burlington Heights, situated at the west end of the harbour. Four bridges cross the canal, one a new high-level structure, two carrying railway tracks, and the fourth a low-level highway bridge. The high-level bridge is well lighted at night, its four end towers having flood lights attached.

The canal is 40 feet (12<sup>m</sup>2) in width, with depths varying from 3 to 6 feet (0<sup>m</sup>9 to 1<sup>m</sup>8). Its western end, at **Dundas**, has a turning basin, 2½ miles west of the entrance. There are no locks. The minimum clearance is 26 feet (7<sup>m</sup>9) at the low highway bridge.

The canal, now not used for commercial purposes, was dredged through the bay inside of the heights and known as **Coots Paradise** and thence through **Dundas Marsh** to Dundas.

## CHAPTER VI

### LAKE ONTARIO

#### HAMILTON TO NIAGARA RIVER

Chart 2063.

5 **Coast.**—The high land, which at Hamilton is about 2 miles southward of the harbour, as mentioned in the description of Hamilton, falls back  $1\frac{1}{2}$  miles at the east end of the city. It then gradually approaches the shore again toward Grimsby, where it is only one mile inland. From there, it falls back until at Queenston on the Niagara River it is 7 miles from the lake shore.

10 Westward of Grimsby, the land rises abruptly, but eastward of the same place it rises more gradually. The low and fairly level land between the high land and the lake shore, a part of what is known as the Niagara fruit belt, is most adaptable for fruit-growing. Numerous orchards and vineyards are seen from the offing.

15 At the south end of Hamilton Beach, **Redhill Creek** flows into the lake, and **Stony Creek**, of battlefield fame, is 3 miles from the beach.

20 From Burlington, the shore which consists of a fine sand beach, as already mentioned in the description of Hamilton Beach, trends a little southeastward in a gentle curve for a distance of  $4\frac{1}{2}$  miles. From here, the curve of the shore becomes more accentuated. The shore, which at the same time changes its character to that of a low bank, then trends eastward for a distance of about 5 miles to **Fiftymile Point**, forming two slight nameless points with shallow bights on each side. Because of the absence of distinctive marks, Fiftymile Point, being low, is only picked up from the offing with difficulty.

25 **Winona Village** is about  $1\frac{1}{2}$  miles back from the shore at Fiftymile Point and on the highway. **Winona Park** is at the lake shore on the west side of the point.

30 The shorebank, for the first 5 miles along this coast, is half a mile wide; it then rapidly increases in width until,  $2\frac{3}{4}$  miles westward of Fiftymile Point, it has acquired three times that width, at the same time the soundings becoming irregular and the nature of the bottom changing to that of a diversity of rock, boulders, or sand. It then diminishes in width toward the point, off which it is only half a mile wide.

35 From Fiftymile Point (*Lat.  $43^{\circ} 14' N.$  Long.  $79^{\circ} 38' W.$* ) to the point at Grimsby,  $3\frac{1}{2}$  miles eastward, the shore forms a wide, open, shallow bight, off which the soundings are irregular, and the shorebank attains a width of  $1\frac{2}{3}$  miles.

40 Near Fiftymile Point, there is a depth of 15 feet (4<sup>m</sup>6) bearing  $081^{\circ}$ , distant  $1\frac{1}{4}$  miles from the north extreme of the point. There is also a depth of 21 feet (6<sup>m</sup>4), bearing  $079^{\circ}$  and distant 2 miles from the same point. Off the point at Grimsby, the shorebank is two-thirds of a mile wide.

**Grimsby.**—**Fortymile Creek**, the mouth of which is on the east side of the point situated 4 miles eastward of Fiftymile Point, runs through the village of Grimsby, situated about two-thirds of a mile from the lake shore. Grimsby,

## Chart 2063.

which is situated 14 miles eastward of Hamilton, had a population of 3,805 in 1956. It is a station on the Canadian National Railways.

The mouth of Fortymile Creek lies between two short, wooden piers about 100 feet (30<sup>m</sup>5) apart. Shelter may be found for small boats just inside the entrance. There is only 2 feet (0<sup>m</sup>6) of water over the sand bar at the entrance. 5

**Grimsby Beach**, a summer resort, on the lake shore, is situated in a clump of pines, 1 $\frac{1}{4}$  miles eastward of the mouth of Fortymile Creek.

From Grimsby Beach, the shore trends eastward to a point 6 miles distant, and has a shorebank about one mile in width, with irregular soundings and 10 shallow water extending out as much as one-quarter of a mile at places.

From this point, which is situated 7 $\frac{1}{2}$  miles west of Port Dalhousie, the shore turns inward to form a wide open bay, in which the shorebank is a little more than half a mile wide. Clay banks 25 to 45 feet (7<sup>m</sup>6 to 13<sup>m</sup>7) in height follow most of the shore closely, leaving little or no space for boat landing. 15 There is a sand beach at Jordan and another one 2 $\frac{1}{2}$  miles eastward, affording good landing.

**Jordan Harbour** (*Lat. 43° 11' N. Long. 79° 22' W.*), 5 $\frac{3}{4}$  miles westward of Port Dalhousie, is a shallow bay, one to 5 cables in width, and 1 $\frac{1}{4}$  miles in length, situated on the southwest side of the above-mentioned wide open bay. 20 The mouth of the bay is entirely protected by a low and narrow sand bar, through which there is a narrow entrance protected on the east side by the remains of an old pier jutting out into the lake at right angles to the shore; some of the ruins are submerged at the outer end. The entrance of the bay is crossed by a stationary highway bridge having a 5-foot (1<sup>m</sup>5) clearance. Over 25 the shifting sand bar at the entrance there is, at times, less than 2 feet (0<sup>m</sup>6) of water. The bay has an average depth of 3 feet (0<sup>m</sup>9) with slightly deeper water just inside the entrance. **Twentymile Creek** flows into Jordan Harbour. 25

**Artillery firing range.**—An artillery firing range has been established covering the area from the southeast side of Burlington Channel to Grimsby 30 Beach. The northwest corner lies 7 $\frac{1}{4}$  miles north of a point on the beach located 2 miles west of Fiftymile Point. The east boundary extends due north of Grimsby Beach 9 $\frac{1}{2}$  miles.

The boundary of this area will be marked by spar buoys, orange-yellow in colour, topped with small evergreen trees or red flags. 35

Mariners are warned that this is a prohibited area at all times, and if they enter it they do so at their own peril.

## Charts 2070, 2063.

**Port Dalhousie**, a town in Lincoln County, had a population of 3,087 in 1956. It was prominent as the Lake Ontario terminal port of the old Welland 40 Canal. It is situated on the lake shore 27 miles southeastward of Hamilton Harbour entrance and 10 miles southwestward of Niagara River entrance. Port Dalhousie is also the port of **St. Catharines**, the latter town being 4 miles distant. It is served by the Niagara, St. Catharines and Toronto Railway. At this port is the dry dock of the Muir Brothers Dry Dock Limited (see page 86). The entrance of the harbour is between two parallel concrete piers, 200 feet (61<sup>m</sup>0) apart. The east pier, 2,300 feet (701<sup>m</sup>0) in length, extends out 1,500 feet (457<sup>m</sup>2) from the shore, 250 feet (76<sup>m</sup>2) beyond the outer end of the west pier. 45

## Charts 2070, 2063.

In the approach of the harbour, a cut, the sides of which are nearly in the alignment of the entrance piers, has been dredged to a depth of 16 feet (4<sup>m</sup>9) for a distance of about 1,000 feet (304<sup>m</sup>8) northward of the outer end of the 5 east pier. The depth in the channel, 100 feet (30<sup>m</sup>5) wide, between the entrance piers is 10 feet (3<sup>m</sup>0). However, the controlling depth in the harbour is 9 feet (2<sup>m</sup>7). Southward of the inner end of the entrance piers, the harbour widens out and a central pier divides it into two parts; Lock No. 1 of the Second 10 Welland Canal, now out of use, is on the west side and Lock No. 1 of the Third Welland Canal is on the east side of the inner part of the Harbour. Vessels use the Third Welland Canal lock in order to enter the dry dock. The harbour has a greatest width of 725 feet (221<sup>m</sup>0) and the distance from the inner end of the east pier to Lock No. 1 of the Third Welland Canal is 2,000 feet (609<sup>m</sup>6).

**Leading lights.—Fog signal.**—Leading lights are shown at Port Dal- 15 housie. The front light is exhibited, at an elevation of 42 feet (12<sup>m</sup>8), from a white, square tower on the outer end of the east breakwater; the rear light is exhibited, at an elevation of 56 feet (17<sup>m</sup>1), from a white, octagonal tower, 1,500 feet (457<sup>m</sup>2), 177° from the front light.

A fog signal is sounded from the front light.

20 The west pier is well illuminated, and can be seen from a long distance seaward.

**Buoy.**—A red spar buoy marking a 14-foot (4<sup>m</sup>3) patch on the west side of the channel, at the entrance to Port Dalhousie, is moored 300 feet (91<sup>m</sup>4), northward of the outer end of the west pier.

25 **Ice** forms about the middle of December and breaks up in March.

**Dry Dock.**—The Port Dalhousie Shipyards Ltd. dry dock is situated on the west side of the harbour immediately above the old lock. Two vessels can be docked at the same time, side by side, one 225 (68<sup>m</sup>6) and another 185 feet (56<sup>m</sup>4) in length. The entrance gate is about 45 feet (13<sup>m</sup>7) in width and 30 has 10½ feet (3<sup>m</sup>2) of water over the sill.

Vessels proceeding to the dry dock must pass through the opening, 60 feet (18<sup>m</sup>3) wide, in the tow path separating the basins of the two old canals above lock No. 1. The opening is situated 850 feet (259<sup>m</sup>0) above the lock. At the regulated state of the basin there is a least depth of 10½ feet (3<sup>m</sup>1) in the opening. This least depth can be increased by previous arrangement with the lock-master at lock No. 1, who may allow the level of the basin to rise by about one foot (0<sup>m</sup>3), and thus increase also the depth of water over the sill of the gate of the dry dock by the same amount, to 11½ feet (3<sup>m</sup>6).

40 **Rifle ranges**, with one stop butt, are situated about half a mile eastward of Port Dalhousie. Because of rifle practice, the danger area not being marked with buoys, vessels should not pass closer than 1½ miles off shore. Any vessel passing closer incurs serious risk, and no attempt should, under any circumstances, be made to pass close in as long as the red flag hoisted on the stop butt is left flying.

45 **Port Weller** is situated 3 miles northeastward of Port Dalhousie, and is the northern entrance to the Welland Ship Canal. (See page 91).

**Coast.**—From Port Weller the shore, being very nearly straight, trends northeastward to **Fourmile Point**, 5 miles distant. At this low gravelly point, covered with tall trees and swampy on the east side, the shore turns inward and

*Charts 2070, 2063.*

trends very nearly east for a distance of 3 miles to the mouth of Niagara River. Niagara Bar, a shoal of extensive size, extends from this point and the shore eastward. (See page 89).

The shorebank from Port Weller to Fourmile Point diminishes from  $1\frac{1}{4}$  5 miles to two-thirds of a mile in width.

**Fourmile Creek** flows into the lake at Fourmile Point (*Lat. 43° 16' N. Long. 79° 08' W.*); between it and Port Weller is **Eightmile Creek** flowing through **McNab** crossroads with a church steeple half a mile back and visible from the lake. **Tenmile Creek** flowed out where Port Weller now stands. These 10 were named by their respective distances from the mouth of Niagara River. **Twomile Creek** flows out through the military camp-ground just west of Niagara-on-the-lake.

*Charts 2066, 2063.*

**Niagara-on-the-Lake**, a town in Lincoln County, is situated on the west 15 side of the mouth of Niagara River. Tall trees hide most of the town and comparatively few buildings are seen from the lake. It is a station on a branch of the Michigan Central Railway, which runs from Niagara Falls. There are substantial wharves and landing places capable of accommodating large lake vessels. By highway, it is 12 miles from St. Catharines and 14 miles from 20 Niagara Falls, Ont.

A ferry, carrying passengers only, is operated between Niagara-on-the-Lake, Ontario, to Youngstown, New York State. It gives a half-hourly service, from 5 a.m. till 6 p.m. beginning May 1 and ceasing on November 1.

**Fort Mississauga**, with its earthwork and the blockhouse in the middle 25 of the low ground inside the fort, is situated on the edge of the bank at the west entrance point of the river. It is fairly conspicuous. Across the river mouth on the United States shore is old Fort Niagara.

Conspicuous marks, visible from seaward, are the Presbyterian church steeple in the western part, the water standpipe in the central part, and the 30 Roman Catholic church steeple in the eastern part of the town.

**Wharf.**—The wharf of the Canada Steamship Lines, Limited, is situated along the west side of the river, 7 cables from the west entrance point. There is deep water along the wharf. Behind the wharf, there is a slip, with a least depth of 5 feet ( $1^m5$ ), affording good shelter. Because of the  $1\frac{1}{2}$  to 2-knot 35 current at the entrance of the river, the swell of the lake is not felt at the wharf during storms.

**Leading lights.**—**Fog signal.**—Leading lights are shown at Niagara-on-the-Lake. The front light is exhibited, at an elevation of 30 feet ( $9^m1$ ), from a white, square tower on the southern end of the Canada Steamship Lines 40 wharf; the rear light is exhibited, at an elevation of 43 feet ( $13^m1$ ), from a white, square tower, 690 feet ( $210^m3$ ),  $149\frac{1}{2}$ ° from the front light.

A fog signal is sounded on the river bank,  $1\frac{1}{2}$  cables northwestward of the front light.

**Ice** forms about January 1 and breaks up the latter part of April.

**Rifle ranges**, the lines of fire of which is about northwest, are situated close to the shore one-quarter of a mile westward of Niagara River entrance. Other ranges, the line of fire of which is also about northwest are situated close

Charts 2066, 2063.

to the shore one mile westward of the river entrance. On account of rifle practice, the danger area not being marked with buoys, vessels should not pass closer than  $1\frac{3}{4}$  miles offshore. Any vessel passing closer in incurs serious risk, 5 and no attempt should, under any circumstances, be made to pass close in as long as the red flag hoisted on the stop butts is left flying.

Another range is located  $1\frac{3}{4}$  miles westward of the entrance of the river. The danger zone extends from this point lakeward about 8,000 feet (2,438<sup>m</sup>4) and eastward about 5,600 feet (1,706<sup>m</sup>9). The boundaries of the danger zone 10 are marked by red steel barrel buoys with "Danger" painted in white on each end. Mariners must navigate with caution in this vicinity when firing is in progress.

A firing range has been established east of the mouth of the Niagara River, starting at a point about 2,000 feet (609<sup>m</sup>6) east of the east entrance point and 15 extending eastward 3,000 feet (914<sup>m</sup>4) along the shore and 9,000 feet (2,743<sup>m</sup>2) offshore. All vessels and small craft are prohibited from entering this area at all times.

**Niagara River** separates the Province of Ontario from the State of New York. From the mouth of the river up to Niagara Falls, a distance of nearly 20 11 miles, the International Boundary follows very nearly the middle of the river. The river is navigable as far up as Queenston, Ont., 6 miles from Niagara-on-the-Lake. The Canada Steamship Lines, Limited, have a wharf at Queenston, and also one at Lewiston, N.Y., across the river. This part of the river is deep and the sides are bold and fairly steep-to, except at the mouth, on 25 the west side, and just inside the river on the east side, where there are shallow banks extending out about 200 yards (182<sup>m</sup>9).

**Brock Monument**, a tall circular column erected on the high land south of Queenston, showing above the skyline, can be seen from a considerable distance on the lake.

30 **Fort Niagara**, an old fort, in the State of New York, is situated on the east point of the mouth of the river. The fort and the old stone buildings are conspicuous. There is a wharf and landing place, about 150 feet (45<sup>m</sup>7) long, just inside the river mouth, which can be reached by vessels drawing 14 feet (4<sup>m</sup>3).

35 The most conspicuous mark, however, is a tall, cylindrical watertank, situated 1,350 feet (411<sup>m</sup>5) eastward of the east extreme of the point.

**Light.**—A light is exhibited, at an elevation of 91 feet (27<sup>m</sup>7), from a gray, octagonal tower, with upper part painted yellow on the eastern entrance point of the Niagara River.

40 **Storm Signals.—Coast guard.**—A coastguard and storm warning station is located on the east side of the river entrance. Day and night storm warning signals are displayed from a steel tower on the west side of the fort, a few yards west of the coastguard station. The life-boat is manned by a regular crew and a 24-hour watch is kept.

45 There is a substantial wharf, 500 feet (152<sup>m</sup>4) long, with a depth of 21 to 22 feet (6<sup>m</sup>4 to 6<sup>m</sup>7) along its face.

**Youngstown**, a small town in the State of New York, is situated on the east side of the river about one mile above Fort Niagara. The chief importance of this town, from the point of view of navigation, is that it has a tall water

## Charts 2066, 2063.

standpipe, which is conspicuous, and may be used as a leading mark for vessels crossing Niagara bar in a northward or southward direction. (See directions, page 90).

**Niagara Bar.**—The silt from the river has formed a bank 3 miles wide at the mouth of the river. The shallow part of this sandbank extends out  $3\frac{1}{2}$  miles in a northeasterly direction from Fourmile Point. It has an average width of one mile, under the depth of 18 feet (5<sup>m</sup>5). On it are several ridges trending northwestward and southeastward, each with a least depth of 9, 10, or 11 feet (2<sup>m</sup>7, 3<sup>m</sup>0 or 3<sup>m</sup>4). The outer one of these ridges bears about 356°, and is 10 distant  $2\frac{1}{2}$  miles from Fort Mississauga on the west entrance point of the river. Southeastward of the shallow part of this bank which is called Niagara Bar, and the shoal waters on each side of the river, there are depths of 18 to 30 feet (5<sup>m</sup>5 to 9<sup>m</sup>1). Shallow water, for a width of 300 to 400 yards (274<sup>m</sup>3 to 365<sup>m</sup>8), borders the shore for several miles on each side of the mouth of the 15 river. Storms may shift these banks, because of the fineness of the sand.

**Clearing marks.**—Brock Monument in line with Fort George flagstaff near the rear light, Niagara-on-the-Lake, and also with the west corner of the south blockhouse of Fort Niagara bearing 176°, leads in good water clear of the shallow part of Niagara Bar, 1,000 feet (304<sup>m</sup>8) eastward of the light-and-bell-buoy. 20

At the west extreme of the east entrance point, the deep water is only a few feet off. From this point, the 18-foot (5<sup>m</sup>5) line trends northwestward for a distance of nearly one mile and then abruptly turns eastward. The northwest extreme of the area, defined by this contour, bears 354° and is distant 25 nearly three-quarters of a mile from Fort Mississauga. On this area is a small patch, with 5 feet (1<sup>m</sup>5) of water upon it, bearing 342° and distant about half a mile from the northwest extreme of the east entrance point of the river.

**Clearing marks.**—Youngstown standpipe in line with the west extreme of the east entrance point of the river, bearing 133 $\frac{1}{2}$ °, leads in good water, clear 30 and westward of the shoal area just described.

**Buoys.**—Niagara Bar light-buoy, 2 (*Lat. 43° 19' N. Long. 79° 04' W.*) painted red, and fitted with a radar reflector, showing a *flashing white* light, is moored in 42 feet (12<sup>m</sup>8) of water about  $3\frac{7}{8}$  miles, 352 $\frac{1}{2}$ ° from Fort Niagara light. 35

Niagara Bar gong-buoy, 4, a red conical buoy with a red reflector and gong, is moored  $2\frac{7}{8}$  miles, 350° from Fort Niagara light.

Fort Niagara light-and-bell-buoy, 1, painted black, and showing a *flashing white* light, is moored in 16 feet (4<sup>m</sup>9) of water at the northwest end of the shoal about one mile, 315 $\frac{1}{2}$ ° from Fort Niagara light. 40

**Tiderips and eddies.**—The current at the mouth of the river is from 1 to 2 knots. This causes, in northerly winds, eddies to form close to the east entrance point, and tiderips near the light-buoy and also near the point on which Fort Mississauga is situated. The tiderips are at times of sufficient size to be dangerous for small craft. 45

**Rumsey Shoal**, with 13 feet (4<sup>m</sup>0) least water upon it, is 3 cables long east and west and 250 feet (76<sup>m</sup>2) wide. It lies  $1\frac{1}{2}$  miles northeastward of Fort Niagara. Brock Monument in line with Fort George flagstaff and also with the west side of the south blockhouse of Fort Niagara, leads in good water a short distance westward of the shoal. 50

Charts 2066, 2063.

**Directions for vessels entering Niagara River.**—The leading lights brought in line, bearing  $149\frac{1}{2}^{\circ}$ , lead over Niagara Bar in 13 feet ( $4^{\text{m}}0$ ) least water, passing close to and westward of a 9-foot ( $2^{\text{m}}7$ ) spot, when  $3\frac{1}{4}$  miles 5 from the front light, and also close to and eastward of another 9-foot ( $2^{\text{m}}7$ ) spot,  $2\frac{3}{4}$  miles from the same light. The range also leads in 16 feet ( $4^{\text{m}}9$ ) of water over the edge of the shoal water, near the buoy a little over a mile from the front leading light. The leading lights being only 690 feet ( $210^{\text{m}}3$ ) apart it may be found difficult to keep them in one, when passing over the bar, because 10 of cross currents running eastward. Keep well on the range, steering  $149\frac{1}{2}^{\circ}$  until close to the wharf on the west side of the river.

In the daytime, a vessel may run Niagara Bar, also in 13 feet ( $4^{\text{m}}0$ ) of water, by bringing Youngstown standpipe in line with Fort Niagara lighthouse and also with the northeast side of the north blockhouse of the fort, bearing 15  $142\frac{1}{2}^{\circ}$ . This range may be kept, until one mile northward of the light-buoy, or  $2\frac{1}{3}$  miles from the front leading light. From this point, however, the vessel should run in on the line of the leading lights.

A vessel may also, when  $3\frac{1}{2}$  miles out, bring Brock Monument in line with Fort George flagstaff and also with the west corner of the south blockhouse of 20 Fort Niagara bearing  $176^{\circ}$ . This range leads  $1\frac{2}{3}$  cables eastward of the gong-buoy on the northeast side of Niagara Bar. Keep on the range, until the vessel is 2 cables southward of the buoy, then steer about  $200^{\circ}$ , crossing the range of the lights, until Youngstown standpipe is brought in line with the west extreme of the east entrance point of the river bearing  $133^{\circ}$ . Run in on 25 these marks, until the leading lights are brought in one again, and proceed up on that range, thus having passed in 20 feet ( $6^{\text{m}}1$ ) least water east and southeastward of Niagara Bar.

*United States chart 256.*

**Niagara River below Niagara Falls.**—The lower Niagara River is navi- 30 gable from Lake Ontario to Lewiston, New York, at the foot of the Niagara Rapids, and across the river from the Ontario town of Queenston, 7 miles above the mouth. There is an unobstructed channel, 1,500 to 2,000 feet ( $457^{\text{m}}2$  to  $609^{\text{m}}6$ ) wide, 30 to 70 feet ( $9^{\text{m}}1$  to  $21^{\text{m}}3$ ) deep, and capable of floating the largest ships.

35 **Queenston**, on the Canadian side, just below the heights on which stands Brock Monument, and at the foot of Niagara Gorge, has a dock about 200 feet ( $61^{\text{m}}0$ ) long, with a depth along its face of 10 to 13 feet ( $3^{\text{m}}0$  to  $4^{\text{m}}0$ ).

**Lewiston**, New York State, has a wharf about 300 feet ( $91^{\text{m}}4$ ) long. It has connection by electric railway with Fort Niagara, and by other railways 40 with Niagara Falls.

The Suspension bridge spans the river just above Queenston and at the foot of the gorge.

Above the bridge are rapids and swift water the full length of the gorge.

**Whirlpool Rapids** are  $3\frac{1}{2}$  miles above the bridges in a bend of the gorge. One 45 mile farther up are the bridges connecting the two cities of Niagara Falls, Ontario, and New York, and  $2\frac{1}{4}$  miles above these bridges are the Niagara Cataracts.

## CHAPTER VII

### WELLAND SHIP CANAL

#### POR T WELLER, LAKE ONTARIO TO POR T COLBORNE, LAKE ERIE

*Charts 2042, 2050, 2180.*

The Welland Ship Canal, which crosses the Niagara Peninsula, overcomes the difference in level between Lakes Ontario and Erie caused by the Niagara escarpment. It supersedes the former Welland Canal. Leaving Lake Ontario at Port Weller (about 3 miles east of Port Dalhousie) it follows an entirely different route to the former Welland Canal as far as Thorold. From this point to the Lake Erie entrance at Port Colborne, the new route adheres in general to that of the old canal, certain short diversions therefrom having been made to secure better alignment. 5 10

The canal is lighted by electricity throughout and electrically operated.

#### Principal dimensions:—

Length of canal .....	27.60	statute miles	15
Number of locks—			
Guard .....	1		
Lift .....	7		
Dimensions—			
Lock 1 (Port Weller) .....	865	feet by 80 feet	20
Locks 2, 3, 4, 5, 6 and 7 .....	859	feet by 80 feet	
Lock 8 (Guard lock, Port Colborne) .....	1,380	feet by 80 feet	
Guard gates (Thorold) .....	1		
Total rise or lockage .....	327	feet	
Depth of water on lock sills .....	30	"	25
Depth of canal prism .....	25	"	
Breadth of canal prism at bottom .....	200	"	
Breadth of canal prism at surface of water .....	310	"	
Minimum overhead clearance .....	120	" (Lift bridges)	30

(Detailed descriptions of the route, principal features, railroad and highway crossings, wharves and landings, ports, etc., are found in pages 99 to 110. Rules and regulations, pages 94 to 99.)

## Chart 2042.

## Mileage and General Data

Mileage	Structure, Locality, etc.	LOCKS				
		Length Between Hollow Quoins	Usable Length	Minimum Width	Depth on Sill	Lift
		feet	feet	feet	feet	feet
(Lake Ontario—Standard low water, 243.0 above M.S.L.)						
0.00	Lake Ontario entrance—Port Weller					
1.17	Gate lifter dock					
1.51	Small boat dock					
*1.90	Lock 1—Port Weller	865	715	80	30.0 (min.)	46.0 (max.)
2.01	Bridge 1—Lake Shore Road—Single bascule					
2.08	Entrance to Drydock					
3.70	Lock 2	859	715	80	30.0	46.5
3.80	Bridge 3—Carleton Street—Single bascule					
5.15	Turning Basin—vessels up to 350 feet long					
5.19	St. Catharines Wharf (390 ft. long—22 ft. depth)					
5.62	Bridge 4—Queen Elizabeth Way—Double bascule					
6.35	Lock 3	859	715	80	30.0	46.
7.05	Bridge 5—Merriton—Vertical lift					
7.20	Hydro-Electric power line					
7.50	Welland Ship Canal power house					
7.58	Bridge 6—Can. Nat. Rys.—2 single bascules					
7.66	Lock 4—Twin in flight	859	715	80	30.0	47.9
7.83	Lock 5—Twin in flight	859	717	80	30.0	47.9
8.00	Lock 6—Twin in flight	859	717	80	32.8	43.7
8.60	Lock 7—Thorold	859	717	80	30.0	46.5
8.71	Bridge 7—Peter Street—Thorold—Single bascule					
8.96	Bridge 8—N. St. C. & T. Ry—Swing, 80' channel					
9.05	Thorold Wharf (787 ft. long, 31 ft. depth)					
9.30	Centre of Turning Basin—Vessels up to 800ft. long					
9.40	Ontario Paper Company Wharf No. 1 (500 ft. long, 21 ft. depth)					
9.45	Shriners Culvert					
9.55	Guard Gate and Safety Weir					
9.55	Bridge 9—Thorold-Allanburg Road—Single bascule					
9.75	Ontario Paper Company Wharf No. 2 (470 ft. long, 26 ft. depth)					
9.95	Mooring dolphins					
10.17	Beaverdams culvert					
10.17	Beaver Board Wharf (1,000 ft. long, 26 ft. depth)					
10.45	Bridge 10—Can. Nat. Rys.—Vertical lift					
10.55	Hydro-Electric power line					
11.33	Davis culvert					
11.51	Third Canal channel to H.E.P.C. Weir 2.					
11.94	Bridge 11—Highway 3-A, Allanburg—Vertical lift					
12.11	Hydro-Electric power line					
13.00	Hydro-Electric power line					
14.52	Bridge 12—Port Robinson—Vertical lift					
15.10	Centre of Turning Basin—Vessels up to 600 ft.					
18.30	Welland River Aqueduct—Welland					
18.52	Bridge 13—Main Street, Welland—Vertical lift					
19.07	Hydro-Electric power line					
19.09	Bridge 14—Water Street, Welland—Vertical lift					
19.25	Welland Centre Wharf (975 ft. long, 13 ft. depth)					
19.36	Hydro-Electric power line					
19.56	Bridge 15—Michigan Central Railway—Swing— 91.9 and 102.5 ft. draws					
19.79	Bridge 16—Ontario road—Vertical lift					
19.95	Welland South Wharf (626 ft. long, 26 ft. depth)					
20.15	Hydro-Electric power line					
21.50	Bridge 17—Can. Nat. Rys.—Vertical lift					

Chart 2042.

## Mileage and General Data—(Concluded)

Mileage	Structure, Locality, etc.	LOCKS				
		Length Between Hollow Quoins	Usable Length	Minimum Width	Depth on Sill	Lift
(Lake Ontario—Standard low water, 243.0 above M.S.L.)						
21.65	Bridge 18—Forks Road—Vertical lift					
23.65	Entrance to Rameys Bend—10 ft. depth					
24.30	Centre of Turning Basin—Vessels up to 450 ft.					
24.30	Rameys Bend Wharf (1,800 ft. long, 27.5 ft. depth)					
24.42	Robin Hood Wharf (1,000 ft. long, 27 ft. depth)					
24.42	Tailrace from Supply Weir					
24.85	Bridge 19—Highway 3, Port Colborne—Single bascule					
25.02	Lock 8—Guard lock (Port Colborne).....	1,380	1,148	80	30.0	2.0 to 11.0
25.65	Third Canal Wharf, Port Colborne (500 ft. long, 14½ ft. depth)					
25.85	Bridge 20—Can. Nat. Rys.—Vertical lift					
25.91	Bridge 21—Clarence Street—Port Colborne—Vertical lift					
26.20	Centre of West Street Wharf (1,800 ft. long, 14 ft. depth)					
26.23	Centre of East Harbour Wharf (2,650 ft. long, 28 ft. depth)					
27.40	Centre of West Harbour Wharf (2,000 ft. long, 23 ft. depth, and 900 ft. long, 20 ft. depth)					
27.60	Lake Erie entrance—Port Colborne					
Total lift.....						327.0
(Lake Erie—Standard low water, 570.0 feet above M.S.L.).						
Permissible maximum draught in canal is 23.5 feet.						

\* Mileage for all locks is to centre of structure.

## Publications

Masters of vessels navigating the canalized portions of the Great Lakes connecting waterways should provide themselves with the following publications issued by the Department of Transport:

1. "Canal Regulations for the Guidance and Observance of those using and operating the Canals of Canada." 5
2. "Canals of Canada"
3. Special Notices to Mariners issued by the Superintending Engineer of the Welland Canals, St. Catharines, Ontario.

The above publications may be obtained from the Director, Canal Services, Department of Transport, Ottawa, the Superintending Engineer of the Welland Canals, St. Catharines, or from the Administration Building at Locks 1 and 8.

## Chart 2042.

## General Notes.

Timber spar buoys may be used to mark locations, where considered necessary by canal authorities.

5 On the west bank of the canal, upstream and downstream from each movable bridge which is not at a canal lock structure, is placed an illuminated "bridge whistle sign" with the letter "W", bridge number, and the distance in feet from that bridge; also an illuminated bridge "home signal sign" with bridge number, and distance in feet from that bridge.

10 All bridge channel piers, other than those located at the canal locks, have clear lights on them to show their location at night.

Facing upstream and downstream, all movable bridges have signal lights which show *green* when the movable span is fully open, and *red* at all other times.

15 All canal lock structures have, facing upstream and downstream, navigation light signals which show *green* when a vessel may enter the lock, and *red* at all other times. *See "Canal Regulations."*

## CANAL REGULATIONS.

For "General Regulations" *see* pages 25 to 31.

## 20 Regulations Applicable Only to the Welland Ship Canal.

## Radio Communication

82. (1) Masters of vessels equipped with radiotelephone shall, when three miles from the outer end of the Port Weller pier and when abreast of the Three Mile Fairway gas and bell buoy off Port Colborne, call VBX.

25 (2) The master shall state his destination and shall maintain a listening watch while the vessel is within the canal.

## Wintering and Lying-Up

83. (1) Vessels wintering between Lock 8 and the railway bridge at Port Colborne shall vacate their winter berths at the opening of navigation except 30 those on the west side above the approach channel to the Supply Weir.

(2) The rates levied for the services of the Department's canalmen, as set out in section 84, against vessels for the passage through Lock 8 immediately prior to and immediately after wintering or lying-up in the discharge channel from the supply weir at Humberstone immediately below Lock 8, will be 35 allowed to apply on Wintering or Lying-Up Charges imposed under these regulations, when such vessels have come directly from Lake Erie before wintering or lying-up and are returning directly to Lake Erie after wintering or lying-up.

## Canalmen Supplied by the Department—Charges for same

84. For services of canalmen who handle the vessel lines passed to them 40 by the vessel crews during the operation of locking, charges shall be levied against every vessel entering the locks and shall be payable in advance in cash by the master of the vessel to the officer in charge of the statistical office at Port Weller or Port Colborne, or, if so authorized by the Department, shall be payable by the owner of the vessel at a later date, as follows:

45 (a) for each one-way passage through the locks of the canal, vessels not exceeding two hundred and sixty-two feet maximum overall length,

*Chart 2042.*

a charge of twenty-five dollars; all other vessels, a charge of fifty dollars;

(b) for each one-way passage through one or more but not all of the locks of the said canal, half the charges set out in paragraph (a), and the full fee for the round trip will be collected at the port of entry; 5

(c) on vessels being towed in the canal the foregoing charges shall be based on the overall length of the vessel being towed, and no rate or charge will be made against the tug or tugs doing the towing of such vessels; and 10

(d) yachts, small boats or canoes, that are fastened together securely, may be locked through the canal at the charge of a single vessel.

*Regulation No. 84*—(As amended by Order in Council P.C. 1956-1737 dated November 22, 1956).

(2) Notwithstanding subsection (1), no charge is payable under that subsection in respect of 15

(a) any vessel that is owned or chartered by, and operated by, the Government of a country other than Canada, or of a province, and that is not engaged in trade; and

(b) any vessel present in the canal in connection with construction or 20 maintenance work being carried out in the canal, where such vessel is owned or chartered by, and operated by, a person having a contract with Her Majesty or the St. Lawrence Seaway Authority, or with another person having any such contract, for such construction or maintenance work. 25

*Charges for Visits of Fire-Fighting Equipment*

85. When the services of fire-fighting personnel and equipment are furnished to a vessel within the limits of the township of Grantham and Her Majesty is liable for payment of the costs of such services, the owner of the vessel involved shall repay to Her Majesty the amount of such costs. 30

*Traffic Over Movable Bridges*

86. (1) Unless a permit has been issued to the owner by the Superintending Engineer no vehicle shall be moved over a bridge if it has a gross weight in violation of the following specifications:

(a) the gross weight of a vehicle of four wheels with two axles spaced more than eight feet apart shall not exceed twenty-four thousand pounds and the weight upon one axle shall not exceed fifteen thousand pounds; 35

(b) the gross weight of a vehicle of six wheels, so designed that under any loading conditions the ratio of the weight on the middle axle to the weight on the rear axle remains constant, shall not exceed thirty thousand pounds and the weight on one axle shall not exceed fifteen thousand pounds; 40

(c) the gross weight of a vehicle equipped wholly or in part with non-pneumatic tires shall not exceed sixteen thousand pounds and the weight upon one axle shall not exceed twelve thousand pounds; and 45

(d) the gross weight of a vehicle, other than those mentioned in the preceding clauses, shall not exceed twenty thousand pounds and the

## Chart 2042.

weight upon one axle shall not exceed fifteen thousand pounds; if axles are spaced less than eight feet apart the weight on one axle shall not exceed twelve thousand pounds.

5                   *Overhead Clearances at Vertical Lift Bridges*

87. (1) No vessel having masts extending one hundred feet or more above water level shall move in the canal until the owner has furnished the Superintending Engineer or the Superintendent with information concerning the height of such vessel's masts with respect to the vessel's draught markings.

10               (2) No vessel shall move in the canal with masts extending more than one hundred and seventeen feet above water level.

## Vessels Approaching Canal Bridges

15               88. (1) Every vessel approaching and desiring to pass a bridge or pair of bridges over the canal (except upbound at Bridges 1, 3, 6, 7, 8 and 9 or downbound at Bridges 19 and 6) shall sound three long blasts of the whistle or horn when the stem is abreast of the whistling station for such bridge or pair of bridges.

20               (2) A vessel, upbound or downbound, shall not proceed to pass any bridge until such bridge is in the fully open position and the light thereon shows green and, in the case of the pairs of Bridges 17 and 18, and 20 and 21, until both bridges of the pair are in the fully open position and both showing the green light.

## Vessels in Tow

25               89. (1) No tug shall, without permission in writing of the Superintending Engineer, or the Superintendent, tow more than one vessel through any portion of the canal and all conditions contained in such permission shall be complied with; any such vessel handled by one tug shall be propelled with the tug securely tied alongside or astern to insure that the tug will fully control the towed vessel; vessels that are not self-propelled and are longer than two hundred and sixty feet shall be towed through the canal by two tugs, one forward and one aft.

30               (2) The master of a vessel or tug arriving at Port Colborne or Port Weller with two or more vessels in tow for passage through the canal shall arrange with the Superintending Engineer or the Superintendent for the mooring of such vessels of the tow which cannot proceed immediately through the canal; each vessel moored shall be in charge of a representative of the owner, who shall obey the orders of the Superintending Engineer or the Superintendent in any matter relating to the position of the vessel and the accommodation or fastenings thereof.

40               *Speed of Vessels*

90. The maximum speed for vessels moving in the canal, subject to compliance with all other related regulations, shall be as follows:

- (a) for vessels not exceeding two hundred and sixty feet in overall length, eight miles an hour;
- 45               (b) for upbound vessels exceeding two hundred and sixty feet in overall length, seven miles an hour; and
- (c) for downbound vessels exceeding two hundred and sixty feet in overall length, six miles an hour.

## Chart 2042.

*Vessels Approaching Guard Gate and Lock 7*

91. (1) Masters of vessels approaching the guard gate or upper gate of Lock 7 shall do so with caution, and be prepared to tie up if necessary; no vessel shall moor against a dolphin along the east bank of the canal between the guard gate and Bridge 10 except to wait for the opening of Bridge 10 or the guard gate.

(2) Vessels downbound while waiting for Lock 7 shall normally tie to the east wall between Bridges 8 and 7, but in the case of a strong beam wind, may tie to the west wall; two vessels of two hundred and sixty feet in length or 10 less or one larger vessel may be tied to the east wall north of Bridge 8; on the west wall only one vessel of any one type may be tied.

*Vessel Lines*

92. (1) Every vessel of more than two hundred registered gross tons traversing the Welland Ship Canal shall be equipped with four lines in good 15 condition, of sufficient length and strength so that when placed on mooring posts they shall be able to control the movement of the vessel while locking, to prevent damage to canal equipment or to other vessels that may be in the lock, and to keep the vessel in proper position when the lock is being filled or emptied; in tying up, normally the two lines leading aft shall first be placed 20 on mooring posts by canalmen supplied by the Department, following which the two lines leading forward shall be placed by such canalmen; but in case of emergency, at the discretion of the lockmaster or by direction of the vessel's master, all lines may be placed leading aft. For upbound vessels in locks 1 to 7 heaving lines shall be attached to the mooring cable about 2 feet back of 25 the splice of the eye by means of a clove hitch.

(2) On any self-propelled vessel of more than two hundred registered gross tons the winches from which the mooring lines run shall not be operated until a signal has been received from the lockmaster or canalman that the line has been placed on a mooring post.

(3) Barges that are towed or propelled by an accompanying tug and are not equipped with deck winches, and vessels of two hundred registered gross tons and under that are not equipped with deck winches, shall detail one of the vessel's crew to attend to each of the lines at the vessel's cleats or mooring bits, whose duty it shall be to take up the slack as the vessel rises or pay out line as the vessel lowers, to prevent the vessel from striking against the gate fenders, the lock gates or other vessels that may be in the lock, and to control the vessel while the lock is being filled or emptied.

(4) When preparing vessel lines for lockage operations, the lines shall be drawn off the winch drums outward through the chocks and then laid out 40 on the deck is sufficient length to reach the lock mooring post.

(5) Upbound and downbound vessels shall set their lines to the east wall of Lock 1, 2, 3, and 7; to the west wall of Lock 8; and to the centre wall of Locks 4, 5, and 6.

*Heaving Lines*

93. Downbound vessels shall use their own heaving lines.

*Vessels Locking*

94. (1) No downbound vessel shall proceed into a lock so far that her stem passes the STOP sign near the lower gates until the lower gates are opened.

## Chart 2042.

(2) The stem of any upbound vessel shall not pass the STOP sign near the upper gates until the upper gates are opened; the stern of any vessel shall not be less than twenty-five feet from the fender.

5 (3) A vessel proceeding into a lock shall put her first line ashore when passing the open lock gates and from a point two hundred feet or more before her stem reaches the sign marked STOP on the lock wall near the closed gates she shall be moved into position by her lines and winches only, except that her engine may be worked astern to check her speed or stop.

10 (4) When two or more vessels are locking together, the leading vessel shall conform to subsections (1), (2) and (3); the following vessel shall manoeuvre to a tie-up position by means of lines and the use of her propeller working astern so as to come to a full stop a sufficient distance from the leading vessel to avoid collision.

15 (5) A vessel with a bow structure extending less than twelve feet above the water surface, when entering Lock 8, shall stop before her bow has reached the sign marked "C.L." on the lock wall; beyond this point the vessel shall manoeuvre into position by means of her lines and winches and her stem shall not pass the sign marked STOP on the lock wall; to avoid unnecessary delays 20 where vessels may proceed into Lock 8 for a double or triple lockage, vessels of such low freeboard shall check or tie up to allow a vessel with a bow structure extending twelve feet or more above the water surface to precede it into the lock.

(6) While locking, none of a vessel's mooring lines shall be cast off until the gates and fenders of the lock and the bridge (if any) at the lock are in the 25 fully open position; a signal that the vessel may proceed will be given by the lockmaster to the master of the vessel; the master of the vessel is responsible for the control of the vessel at all times.

## Vessel Movement

95. (1) Bridge No. 21 (Port Colborne) will be lowered for highway traffic 30 immediately after the passage of each downbound and upbound vessel between the hours of 7.30 a.m. and 8.30 a.m.; 3.30 p.m. and 4.30 p.m.; between 11.30 p.m. and 12.30 a.m.; and no vessel during these periods shall follow, or attempt to follow, another vessel under Bridge No. 21 unless the bridge has been lowered between such two vessels.

35 (2) Vessels shall not be turned in the canal except at the following turning basins:

(a) Port Weller Harbour—for any vessel;

(b) opposite the St. Catharines Wharf—for vessels up to three hundred and fifty feet in length;

40 (c) Thorold—for any vessel;

(d) south of Port Robinson—for vessels up to six hundred feet in length;

(e) opposite the Welland Centre Wharf—for vessels up to two hundred and sixty feet in length, provided that permission has first been obtained from the bridgemaster at Bridge 14;

45 (f) opposite the Welland South Wharf—for vessels up to two hundred and sixty feet in length, provided that permission has first been obtained from the bridgemaster at Bridge 16;

(g) North of Lock 8 (Rameys Bend)—for vessels up to five hundred and fifty feet in length, provided that permission has first been obtained 50 from the lockmaster at Lock 8.

*Chart 2042.*

(3) Masters of vessels that have been tied to wharves or other sites on the Welland Ship Canal shall, before proceeding farther, obtain permission to do so from the officer in charge at Station VBX at the guard gate or from the officer in charge at the nearest canal structure or, in the following cases, from the officer in charge of the structure indicated in each case: 5

- (a) St. Catharines Wharf—from Lock 2;
- (b) Thorold Wharf—from the guard gate;
- (c) Ontario Paper Company's wharves—from the Administration Building, Port Weller, by Bell Telephone or from the guard gate by messenger; 10
- (d) wharf on east side of canal north of Bridge 10—from Bridge 10 by telephone or messenger;
- (e) Welland Centre Wharf—from Bridge 14 by messenger;
- (f) Welland South Wharf—from Bridge 16 by messenger;
- (g) wharf on east side of canal north of Lock 8—from the Administration 15 Building at Lock 8 by Bell Telephone or from Lock 8 by messenger;
- (h) leased areas east of Thorold Turning Basin—from the Administration Building, Port Weller, by Bell Telephone or from Lock 7 by messenger;
- (i) Port Colborne Harbour or the canal south of Bridge 21—from the Administration Building, Port Colborne, or from the guard gate by 20 radio-telephone VBX.

(4) Masters of vessels that have tied up to the canal bank shall report such action to the officer in charge of the nearest canal structure without delay.

(5) Masters of vessels intending to lighten at the Prescott Elevator shall notify the clerk on duty at the Administration Building, Port Weller, before 25 leaving the canal.

(6) When a vessel is approaching, is moored at, or is leaving the Ontario Paper Company Wharf south of the guard gate at Thorold, its propeller shall not be operated when within seventy-five feet north or south of either end of the wharf and any movement shall be made by the use of lines and winches. 30

*Port Colborne Harbour and Welland Ship Canal Entrance*

96. (1) A vessel downbound, waiting for Lock 8, may moor north of Bridge 20 either to the east wall or the west wall if no vessel is moored to the other wall.

(2) South of highway bridge 21, upbound vessels shall moor on the west 35 side of the harbour and downbound vessels on the east side.

**Port Weller.**—This is an artificial harbour forming the Lake Ontario entrance of the canal, situated 3 miles northeastward of Port Dalhousie, and 6 $\frac{3}{4}$  miles westward of the Niagara River. The harbour consists of two parallel breakwaters of earthwork and reinforced concrete cribwork, built about 800 40 feet (243<sup>m</sup>8) apart, except at the north end where they converge to an entrance 400 feet (121<sup>m</sup>9) wide. The breakwaters extend north (000°) from the shore a distance of 1 $\frac{1}{2}$  miles. Port Weller is not used as a port for discharging or loading freight. The nearest hospital is at St. Catharines, distant 5 miles by highway.

**Wharves.**—A section of the west entrance wall, 600 feet (182<sup>m</sup>9) long, 45 with 25 feet (7<sup>m</sup>6) of water alongside, can be used for coal storage; 300 feet (91<sup>m</sup>4) of this wall is now occupied by the M. A. Hanna Coal Company. Opposite this, on the east side, the M. A. Hanna Coal Company have 500 feet (152<sup>m</sup>4) of coal storage space. The company has a caterpillar loader.

## Chart 2042.

**Lights.—Fog signal.—Radio beacon.**—A light is exhibited, at an elevation of 45 feet ( $13^{\text{m}}7$ ), from a steel tower on a cement building on the outer end of the west breakwater at Port Weller.

5 A fog signal is sounded at the light and a radio beacon is operated.

A light is exhibited, at an elevation of 95 feet ( $29^{\text{m}}0$ ), from a skeleton tower with red slatwork daymarks, surmounted by a red watch-room and lantern, about 3,000 feet ( $914^{\text{m}}4$ ) from the outer end of the west breakwater.

The lights on the west breakwater are not to be used as leading lights.

10 A light is exhibited, at an elevation of 30 feet ( $9^{\text{m}}1$ ), from a white pole on the outer end of the east breakwater at Port Weller.

**Dimensions.**—In August, 1932, this waterway was officially opened and is now available for any lake vessel drawing up to  $23\frac{1}{2}$  feet ( $7^{\text{m}}2$ ), with permissible length and beam. The length of the canal is  $27\frac{1}{4}$  miles between harbour entrances and a total lift of 327 feet ( $99^{\text{m}}7$ ) is accomplished by seven lift locks. These, with one guard lock at the upper end, make a total of eight as compared with twenty-six locks on the former and now abandoned Third Welland Canal. Locks Nos. 1 to 7 all have the same dimensions—859 feet ( $261^{\text{m}}8$ ) long, 80 feet ( $24^{\text{m}}4$ ) wide, and with 30 feet ( $9^{\text{m}}1$ ) of water over their sills. Their usable length is 715 feet ( $218^{\text{m}}0$ ) and their usable width, 80 feet ( $24^{\text{m}}4$ ).

**Depths.**—While a minimum of 30 feet ( $9^{\text{m}}1$ ) of water is provided at all permanent lock structures, only about 20 feet ( $6^{\text{m}}1$ ) is generally available at present at low water levels in the upper lake harbours and channels, and consequently, for the time being, the reaches between the locks on the Ship Canal were excavated to a minimum depth of only 25 feet ( $7^{\text{m}}6$ ). When the future demands of shipping necessitate, this depth can be increased to 30 feet ( $9^{\text{m}}1$ ) by the simple process of dredging the reaches for the additional 5-foot ( $1^{\text{m}}5$ ) depth, without interfering too much with navigation.

**Ice.**—There is no solid ice formation.

30 **Season of navigation.**—During the 10-year period, 1947 to 1956, inclusive, the average date on which the canal was open for navigation was April 2; the average date on which navigation closed was December 15.

**Permissible size of vessels.**—The maximum permissible dimensions of vessels entering the canal are 715 feet ( $218^{\text{m}}0$ ) in length, 72-foot ( $21^{\text{m}}9$ ) beam, 35 and  $23\frac{1}{2}$ -foot ( $7^{\text{m}}2$ ) draught.

**General Route.**—The route of the Welland Ship Canal departs very radically from that of its predecessors, particularly on the lower Lake Ontario level of the Niagara Peninsula. It leaves Lake Ontario at Port Weller, which is about 3 miles northeastward of Port Dalhousie, the northern terminus of the previous canals, and follows in practically a straight line, due south along the 40 valley of the Tenmile Creek to the foot of the Niagara escarpment at Thorold. The alignment is maintained in the ascent of the escarpment itself, although the route of the previous canal is followed, in a general way, from the top of the escarpment to Port Colborne. All the sharp bends of the previous canals 45 are eliminated, and it might reasonably be said that the Welland Ship Canal follows a straight north and south course across the peninsula, between Lake Erie and Lake Ontario.

The first 7 miles of the Welland Ship Canal, southward from Lake Ontario, are flanked by the slightly rising lower level of the peninsula which is deser-

## Chart 2042.

vedly called the "Garden of Canada", because of its natural rolling beauty and intensely cultivated fruit lands. In this section of the Ship Canal are located the first three locks with long straight reaches of canal prism of 200-foot (61<sup>m</sup>0) bottom width and 310-foot (94<sup>m</sup>5) width at water surface, providing ample accommodation for the movement and passage of up- and downbound navigation. These three locks elevate vessels 139 $\frac{1}{2}$  feet (42<sup>m</sup>6) above the Lake Ontario level and bring them to the foot of the Niagara escarpment.

The climb up the face of the escarpment by means of four locks is obtained without any deviation from the direct route. Three of these locks are built in steps, one immediately above the other, so that in a distance of slightly over one-half mile vessels are elevated another 139 $\frac{1}{2}$  feet (42<sup>m</sup>6). This arrangement, however, of three locks in flight necessitates the duplication of these locks to provide separate means of passage for up- and downbound-navigation at the same time, where, with but one flight of locks, a serious delay to the passage of navigation would very often occur.

With only a short intervening stretch of canal prism one-half mile in length, the last of the seven main lift locks, which brings vessels to the summit of Lake Erie level, is reached at the town of Thorold, but this intervening short reach provides adequate space for vessels to pass each other and eliminates, for the present at least, the necessity of twin locks again at that point.

From the head of Lock No. 7 at Thorold, across the remainder of the peninsula to Port Colborne, the ship canal provides the same standard width of waterway as elsewhere, with 200-foot (61<sup>m</sup>0) bottom width and, for the present, a minimum 23 $\frac{1}{2}$ -foot (7<sup>m</sup>2) depth.

**Bridges.**—Spanning the canal at intervals are twenty movable bridges. These consist of two swing bridges, seven bascule bridges, and eleven vertical lift bridges. They accommodate the numerous railway and highway traffic arteries, which cross the peninsula from east to west. The vertical lift bridges, operating on the principle of the counterbalanced elevator, provide for the movable span to be lifted 120 feet (36<sup>m</sup>6) clear of the waterway for the passage of navigation, and offer a much less restricted channel than is provided by the use of the swing bridge so common to navigation waterways. The minimum clearance for all structures throughout the canal is 120 feet (36<sup>m</sup>6).

**Guard lock and water level fluctuation.**—On Lake Erie with its vast expanse of shoal water, the water level is subject to rapid variations caused by changes in the force and direction of the wind; differences in level as great as 11 feet (3<sup>m</sup>4) have been observed at Port Colborne, the result of a change in wind direction from the east to the west. Such a variation, if transferred to the summit of the canal would introduce tremendous and extensive traffic delays, and so tend to defeat the purpose for which this improved waterway is provided. Consequently, at Port Colborne, immediately before the canal joins up with Lake Erie, Lock No. 8 is provided, through which navigation is passed from the regulated summit level to the variable level prevailing on the lake.

**Lock No. 8** is 1,380 feet (420<sup>m</sup>6) long, and has the same standard width and draught, but its lift is determined from day to day by the water surface fluctuation of Lake Erie itself.

**Lock gate berth.**—For the handling and replacement of the lock gates, there is provided a floating pontoon gate lifter, capable of lifting and placing in position any leaf up to one million pounds weight. On the east side of Lock No. 1 pondage, there is located an underwater gate berth where are stored

*Chart 2042.*

six spare gate leaves. Also on the east side of the canal, below Lock No. 1, there is the summer berth for the gate lifter and an underwater gate berth, where are stored two spare gate leaves, available to replace the lower gate leaves at 5 Lock No. 1.

**Dry dock.**—A dry dock, situated on the east bank of the canal, south of Lock No. 1, is leased and operated by the Port Weller Dry Dock Company Limited, and provides accommodation for vessels up to 655 feet (198<sup>m</sup>1) in length. This is the only dry dock on Lake Ontario capable of accommodating 10 vessels of this size.

**Welland River siphon cutout.**—Midway across the peninsula, the summit level of the canal crosses **Chippawa Creek (Welland River)**, a sluggish stream having its source in the western part of the peninsula and flowing in an easterly direction to discharge into the Niagara River at the head of the rapids 15 above the falls. The summit level of the river, being some 6 feet (1<sup>m</sup>8) below the summit level of the canal, necessitated the construction of an under passage by which its waters are carried entirely under the Ship Canal. The foundations of this structure, an inverted siphon culvert, stand at a depth of 86 feet (26<sup>m</sup>2) below the level of the water in the canal, and six tubes, each 22 feet 20 (6<sup>m</sup>7) in diameter, form the water passage by which Chippawa Creek flows on to the Niagara River.

**Windbreaks.**—To guard against cross winds, one of the greatest sources of delay to the navigation of limited artificial waterways, an extensive reforestation program has been carried out along the banks of the Ship Canal. Vast 25 numbers of trees native to the district have been developed, are fast maturing, and the roots of these will bind together the earth embankment of the prism reaches, providing also a greater measure of protection against the erosive action of the water. The trees will form a windbreak by the aid of which vessels may pass during any mood of the winds.

30 **Safety features.**—Protection of the upper gates from upbound vessels is provided by heavy concrete breast walls at the upper end of each liftlock, preventing an upbound vessel, entering a liftlock at the lower level, from ramming the upper gates under any circumstances. Additional protection to these gates is provided by wire rope fenders, above and below each lower gate, and above 35 each upper gate, where no bridge crosses the upper entrance.

All controlling equipment operating the valves, gates, fenders and signals, at each lock, is so interlocked as to protect the equipment and to prevent disaster to both locks and vessels.

40 For use in the event of electric power supply for the canal failing, auxiliary power plants have been installed for all bascule and vertical lift bridges to provide light and control, while the bridges may be operated by mechanical gasoline engines.

**Detailed description and directions for Welland Ship Canal.—Lake Ontario to Lake Erie.**—Approach Port Weller from the lake on a bearing of

45 180° (South) and maintain this course midway between the breakwaters for one-quarter mile after passing inside the entrance piers. A vessel will then be at the inner end of the breakwater basin where the canal entrance narrows, one-half mile below Lock No. 1, and from this point may continue at reduced regulated speed either into the lock, if the signals indicate that it is ready for 50 the passage of a vessel, or moor to the west wall, where indicated by notice boards.

## Chart 2042.

The depth in the entrance basin, between the breakwaters, is 25 feet ( $7^m6$ ) for a width of 800 feet ( $243^m8$ ). The sides of the entrance basin slope upwards to the tops of the breakwater. Between the outer entrance piers, 400 feet ( $121^m9$ ) apart, the depth is 32 to 33 feet ( $9^m8$  to  $10^m1$ ). Outside of the piers, the water deepens to 50 feet ( $15^m2$ ), one-half mile out in the lake. These depths are for the standard low water level elevation of Lake Ontario, namely 243.0 feet ( $74^m1$ ) above mean tide, New York. At the inner or southern end of the east breakwater is a small basin or slip in the canal wall for the accommodation of the gate lifter; 1,200 feet ( $365^m8$ ) inside this slip, and, on the east side, 5 is an indentation with landing steps for the docking of small boats. Vessels having to moor before entering Lock No. 1, should do so along the west wall of the canal entrance where facilities for this purpose have been provided. 10

**Lock No. 1** is situated immediately at the head of the Port Weller basin.

The canal **Administration Building** and **Reporting office** are located 15 on the west bank, abreast of Lock No. 1.

**Bridge No. 1**, a rolling lift span, crosses the canal immediately above Lock No. 1, and permits of the passage of vehicular traffic following the lake shore road.

Immediately above Bridge No. 1, the canal widens out to form a pond, 20 700 to 1,000 feet ( $213^m4$  to  $304^m8$ ) wide. The dry dock, for the repairing and overhauling of vessels and lock gates, is situated on the east side of the pond, a short distance above the bridge.

**Lock No. 2**, similar in all respects to Lock No. 1, is 1.8 miles beyond the latter. Immediately above Lock No. 2, the canal is crossed by a single 25 bascule **Bridge No. 3**, also known as Carleton Street Bridge. The canal reach between Locks Nos. 1 and 2 has a regulated level of 289 feet ( $88^m1$ ) above mean tide, New York.

St. Catharines wharf (also known as Homer wharf), 390 feet ( $118^m9$ ) long and with 22 feet ( $6^m7$ ) of water alongside, is located on the west side of 30 the canal, nearly  $1\frac{1}{2}$  miles above Lock No. 2. Opposite to this wharf, a shallow basin extends into the east bank of the canal forming a pond for storage purposes. Abreast of St. Catharines wharf, a turning basin provides 22 feet ( $6^m7$ ) depth for vessels of up to 350 feet ( $106^m7$ ) in length.

The **City of St. Catharines**, distant by highway from this wharf  $2\frac{1}{2}$  miles, 35 had a population of 39,708 in 1956, and has considerable waterborne trade through the Welland Ship Canal.

**Bridge No. 4.**—A double rolling lift span forming a link in the Queenston highway No. 8 and in the Queen Elizabeth Way, crosses the canal at a distance of 2,200 feet ( $670^m6$ ) south of St. Catharines wharf. Both above and below the 40 bridge and on either side of the channel are clusters of piles.

**Lock No. 3** is five-eighths of a mile above the Queenston highway bridge and is distant 6.35 miles from Port Weller entrance. Immediately above Lock No. 3 and on the east side of the canal, there has been formed a large pond for storage purposes. 45

**Bridge No. 5**, known locally as Merritton Bridge, is situated three-quarters of a mile above Lock No. 3 and is of the vertical lift type.

**Transmission line.**—The Hydro-electric Power Commission electric transmission cables, with a clearance of 150 feet ( $45^m7$ ) cross the canal 780 feet ( $237^m8$ ) south of Bridge No. 5.

## Chart 2042.

The **Twin Flight Locks, Nos. 4, 5, and 6**, are situated 1.3 miles above Lock No. 3, and close by is the town of Thorold. These three pairs of locks are like steps, one above the other, and lift vessels a total height of  $139\frac{1}{2}$  feet 5 (42<sup>m</sup>6).

**Lock No. 7**, one-half mile beyond Lock No. 6, the upper twin lock, has an additional lift of  $46\frac{1}{2}$  feet (14<sup>m</sup>2) and completes the elevation of upbound vessels to the summit level, overcoming the Niagara escarpment.

**Thorold**, on the west bank, abreast of Lock No. 7, had a population of 10 8,053 in 1956.

The Canadian National Railways double-track **Bridge No. 6**, a rolling lift with two spans, crosses the canal at the lower gates of Lock No. 4. Just above Lock No. 6, a pond penetrates the east bank of the canal and is also connected with the canal reach above Lock No. 7 by a by-pass, in which are 15 regulating weirs.

**Bridge No. 7**, Hoover Street, Thorold, a single bascule or rolling lift span, crosses the canal at the head of Lock No. 7.

**Bridge No. 8**, a swing span, over which passes the electric railway, crosses the canal one-quarter of a mile above the head of Lock No. 7.

20 Thorold wharf is situated on the west bank, one-eighth of a mile above Bridge No. 8. It provides wharfing accommodation for the use of shippers of Thorold. There is a 200-foot (61<sup>m</sup>0) transit shed of a forwarding company, and a railway siding on the wharf. Vessels up to 700 feet (213<sup>m</sup>4) in length and 25-foot (7<sup>m</sup>6) draught can use this dock; there is a turning basin opposite it.

25 Immediately south of Bridge No. 8, and on the south side of the Welland Ship Canal, is an island stock pile area occupied by a coal company. East of this area, the deepened channel of the Third Canal provides 18-foot (5<sup>m</sup>5) draught for approximately 800 feet (243<sup>m</sup>8) northerly from the south end of the island. To the south, a paper company has a wharf, with 20 feet (6<sup>m</sup>1) 30 alongside, for the handling of sulphur and pulpwood.

**Bridge No. 9 and Guard Gate.**—Bridge No. 9, a rolling lift span on highway No. 58, crosses the canal at a point almost one mile above Lock No. 7. At this point is also located a safety weir and guard gate, restricting the width of the canal to 80 feet (24<sup>m</sup>4).

35 A **Radio-telephone station** for the control of movements of shipping through the canal is situated at the Guard Gate, with a call sign of VBX. Masters of vessels downbound in the canal from Port Colborne may obtain information as to whether or not the Guard Gate is ready to pass the vessel by calling VBX. Masters of vessels entering Port Colborne Harbour from Lake 40 Erie, which are equipped with radio-telephone, shall telephone Station VBX when approaching Port Colborne light-and-bell-buoy and inform the Lock-master at the Guard Gate as to the destination of the vessel.

45 On the east bank, immediately above the Guard Gate, are the buildings of the Ontario Paper Company, and abreast this is a wharf with a 500-foot (152<sup>m</sup>4) frontage and a depth of 25 feet (7<sup>m</sup>6) alongside. Another wharf, also on the east side of the canal, is situated 1,500 feet (457<sup>m</sup>2) farther upstream; this wharf has a frontage of 1,100 feet (335<sup>m</sup>3) and a depth alongside of 25 feet (7<sup>m</sup>6). To the east of this second wharf are the buildings of the Beaver Wood Fibre Company.

## Chart 2042.

**Bridge No. 10.** Canadian National Railways, a vertical lift type of 200-foot (61<sup>m</sup>0) span, is located one mile above the Guard Gate.

The canal bottom from Bridge No. 10, south for 2½ miles, is solid rock.

**Transmission line.**—The Hydro-electric Power Commission electric transmission cables, with a clearance of 150 feet (45<sup>m</sup>7), cross 500 feet (152<sup>m</sup>4) south of Bridge No. 10.

**Current.**—Masters are cautioned to allow for the currents that may be created at the entrance to the Old Third Welland Canal channel, on the west side of the ship canal north of Bridge No. 11, Allanburg.

**Allanburg.**, a small village, is situated 3½ miles south of Lock No. 7, Thorold, and is on the east bank of the canal.

**Bridge No. 11.** on highway No. 20, is a vertical lift type of 200-foot (61<sup>m</sup>0) span and crosses the canal at Allanburg.

**Transmission lines.**—Two Hydro-electric Power Commission electric transmission cable crossings, with a clearance of 135 feet (41<sup>m</sup>1) each, are located, respectively, at 800 feet (243<sup>m</sup>8) and one mile south of Bridge No. 11.

**Port Robinson.**, a small village, is 2½ miles south of Allanburg and 4 miles north of Welland. It is on the east side of the canal. The principal industries are steel and refractories.

**Bridge No. 12.** a vertical lift highway type of 200-foot (61<sup>m</sup>0) span, crosses the canal at Port Robinson. The bridge piers are each protected by pile dolphins and a floating wooden fender.

**Submarine cable.**—The Hydro-electric Power Commission submarine cable crosses the canal on the south side of Bridge No. 12, in 28 feet (8<sup>m</sup>5) of water.

The Port Robinson turning basin is 3,200 feet (975<sup>m</sup>4) south of Bridge No. 12. Vessels up to 700 feet (213<sup>m</sup>4) in length can turn here. Between this bridge and Bridge No. 13, Welland, a distance of 4 miles, there are three curves in the canal. The width on the water surface averages 400 feet (121<sup>m</sup>9).

Twelve hundred feet (365<sup>m</sup>8) north of the latter bridge, the Welland River crosses under the canal in a concrete siphon culvert. The head walls leave a clear channel 244½ feet (74<sup>m</sup>6) wide. On the east side, 200 feet (61<sup>m</sup>0) north of this bridge, is a small dock for craft not exceeding 40 feet (12<sup>m</sup>2) in length.

**Bridge No. 13.** Main Street, Welland, is a vertical lift type of 200-foot (61<sup>m</sup>0) span. The bridge piers are each protected by pile dolphins and a floating wooden fender. Two 6-inch gas mains cross the canal bottom in 27 feet (8<sup>m</sup>2) of water, 700 feet (213<sup>m</sup>4) south of the bridge. The Hydro-electric Power Commission electric transmission cables, with a clearance of 150 feet (45<sup>m</sup>7), cross one-half mile south of this bridge.

**Bridge No. 14.** Water Street, Welland, a vertical lift type of 200-foot (61<sup>m</sup>0) span, crosses the canal 3,400 feet (1,036<sup>m</sup>3) south of Bridge No. 13. The piers are protected by dolphins and floating wooden fenders.

**Welland.**—The city of Welland is situated on the Ship Canal, 8 miles north of Lake Erie. It is an important manufacturing centre with large steel, iron, textile, twine, rubber, and electrical equipment industries. It is served by

## Chart 2042.

the Michigan Central Railway, the Toronto, Hamilton and Buffalo Railway, the Wabash Railway, and the Canadian National Railways' steam and electrical lines. The Welland County hospital is located here. The population was

5 16,405 in 1956.

The Welland Centre wharf is on the east side, immediately south of Bridge No. 14. It has a usable length of 975 feet (297<sup>m</sup>2) with a depth of 13 feet (4<sup>m</sup>0) along the entire face. One 8-inch pipeline crosses in 30 feet (9<sup>m</sup>1) of water, 100 feet (30<sup>m</sup>5) south of the same bridge. Electric transmission cables, with a 10 clearance of 150 feet (45<sup>m</sup>7), cross the canal one-quarter of a mile south of this bridge. The Western Union Telegraph Company submarine cable crosses 50 feet (15<sup>m</sup>2) north of Bridge No. 15.

**Bridge No. 15**, of the Michigan Central Railway, is a double track swing bridge, which crosses the canal one-half mile south of Bridge No. 14. The centre 15 concrete rest pier is 45 feet (13<sup>m</sup>7) wide, with clear openings of 102 feet (31<sup>m</sup>1) on west and 92 feet (28<sup>m</sup>0) on the east side. The centre pier and east and west abutments are protected by timber trestle work. A 3-inch gas main and a telephone cable cross the canal in 28 feet (8<sup>m</sup>5) of water, 200 feet (61<sup>m</sup>0) north of Bridge No. 16.

20 **Bridge No. 16**, Ontario Road, Crowland, is a vertical lift type of 200-foot (61<sup>m</sup>0) span, situated one-quarter mile south of Bridge No. 15. The bridge piers are protected by dolphins and floating wooden fenders.

**Crowland**.—The Township of Crowland, south of the City of Welland, 25 has a population of approximately 6,000. On the east side of the canal are large steel and pipe mills.

The Welland South wharf is on the east side, 200 feet (61<sup>m</sup>0) south of Bridge No. 16. It is 626 feet (190<sup>m</sup>8) long, with a depth of 26 feet (7<sup>m</sup>9) alongside. Railway tracks on the wharf are leased to steel and pipe companies, but are available for others by arrangement with the leasing companies. Provincial 30 highway No. 58 is adjacent to the wharf. Electric transmission cables with a clearance of 150 feet (45<sup>m</sup>7) cross the canal three-quarters of a mile south of Bridge No. 16.

**Welland Junction** is a small village on the east side at Bridge No. 17 and Bridge No. 18. It is a railway junction, with a plant manufacturing farm 35 equipment.

**Bridge No. 17** of the Canadian National Railways (Wabash Line), a vertical lift type of 200-foot (61<sup>m</sup>0) span, is 1<sup>3</sup>/<sub>4</sub> miles south of Bridge No. 16, and 800 feet (243<sup>m</sup>8) north of Bridge No. 18. The bridge piers are protected by dolphins and floating wooden fenders.

40 **Submarine cables** cross in 27 feet (8<sup>m</sup>2) of water, 350 feet (106<sup>m</sup>7) south of Bridge No. 17. Another cable crosses in the same depth, 50 feet (15<sup>m</sup>2) north of Bridge No. 18.

**Bridge No. 18**, Forks Road, a vertical lift type of 200-foot (61<sup>m</sup>0) span, crosses at Welland Junction. The bridge piers are protected by the usual dolphins and floating wooden fenders. A 4-inch gas-main crosses in a depth of 27 feet (8<sup>m</sup>2) on the south side of this bridge.

**Rameys Bend**.—On the east side, one mile north of Lock No. 8, Port Colborne, is the channel of the Old Third Welland Canal. The maximum depth is about 10 feet (3<sup>m</sup>0). The channel has a blind end and is used by vessels

*Chart 2042.*

undergoing repairs at the Port Colborne Iron Works. The bottom of the canal from Rameys Bend south, and throughout Port Colborne Harbour is of solid rock.

**Wharves.**—On the east side, one-half mile north of Lock No. 8, Port Colborne, is a concrete wharf 1,800 feet (548<sup>m</sup>6) long, with 27 $\frac{1}{2}$  feet (8<sup>m</sup>1) of water alongside. This wharf is adjacent to highway No. 58 and has rail connections with the Canadian Pacific and Canadian National Railways. The northern half is leased to a coal company and bunkerage is available. The south half is for public use. On the west side, one-half mile north of Lock No. 8, 10 is a concrete wharf 1,000 feet (304<sup>m</sup>8) long, with 27 feet (8<sup>m</sup>2) of water alongside.

The elevator of the company that leases a portion of this wharf is a conspicuous landmark. There are highway and rail connections.

The old Third Welland Canal on the west side, opposite the elevator and 15 mill, forms the Port Colborne turning basin, in which vessels up to 450 feet (137<sup>m</sup>2) in length can turn. The depth is 27 feet (8<sup>m</sup>2). This old canal at the elevator is the tailrace of the supply weir. There is a moderate current that may have some effect on vessels turning or docking at the wharves.

**Bridge No. 19**, highway No. 3, Port Colborne, a single leaf bascule type 20 of 80-foot (24<sup>m</sup>4) span, is at the north end of Lock No. 8.

**Lock No. 8**, Port Colborne is 3 $\frac{1}{4}$  miles south of Welland Junction. It is a concrete lock, 1,380 feet (420<sup>m</sup>6) long and 80 feet (24<sup>m</sup>4) wide, with 30 feet (9<sup>m</sup>1) of water over the sills at low water. The usable length is 1,148 feet (353<sup>m</sup>6) between fenders. The lift is from zero to 11 feet (3<sup>m</sup>4) depending upon 25 the stage of the water in Lake Erie.

**Administration Building.**—The reporting office for the southern end of the canal is located 250 feet (76<sup>m</sup>2) west of the centre of Lock No. 8. Port Colborne Marine post office is in the Administration Building. Canadian 30 Hydrographic Service charts of the Great Lakes may be obtained from the statistical clerks.

In 1956, 9,360 vessels passed through the canal, transporting 23,066,261 tons of freight.

**Wharf.**—The Third Canal wharf is on the west side, one-half mile south of Lock No. 8. This wharf is 500 feet (152<sup>m</sup>4) long, built of stone masonry 35 protected by wooden floats. There is 14 $\frac{1}{2}$  feet (4<sup>m</sup>5) of water available at mean low water level of Lake Erie.

**Caution.**—Masters of vessels using the Third Canal wharf will turn their vessels in such a way as not to bring the vessel cross-wise of the raceway at the entrance leading to the supply weir at Port Colborne. 40

**Bridge No. 20**, Canadian National Railways, Port Colborne, a vertical lift type of 220-foot (67<sup>m</sup>1) span, crosses the canal 0.83 mile south of Lock No. 8. Bridge No. 21, also a vertical lift type of 220-foot (67<sup>m</sup>1) span, crosses the canal 300 feet (91<sup>m</sup>4) south of Bridge No. 20.

**Buoy.**—A red spar buoy moored 600 feet (182<sup>m</sup>9) south of Bridge No. 21 45 marks the west edge of 28-foot (8<sup>m</sup>5) depth.

## Chart 2042.

**Port Colborne**, situated on Gravelly Bay, at the southern or Lake Erie entrance to the Welland Ship Canal, is 18 miles west of Buffalo and had a population of 14,028 in 1956. The principal industries are nickel refining, shoe, 5 cement and flour manufacture, ore smelting and transhipment of grain. From the lake, the most conspicuous buildings are the Government elevator, the flour mill and elevator, and the chimneys of the cement and nickel companies. Bunker coal, fuel oil and ship supplies are available. Repairs to vessels are carried out here. The nearest hospital is in Welland, 8 miles to the north via 10 highway No. 58. Port Colborne is served by the Toronto, Hamilton and Buffalo Railway, and the steam and electric lines of the Canadian National Railways.

## Charts 2042, 2174.

**Customs.**—Port Colborne is a port of entry.

**Shipping.**—During the year 1956, 1,681,216 tons were received and 15 409,479 tons were shipped over the wharves at Port Colborne Harbour.

**Port Colborne Harbour** consists of the outer harbour which extends from the original shoreline to the breakwaters, and the entrance to the Ship Canal. The latter part has a depth of 28 feet (8<sup>m</sup>5) and is 300 feet (91<sup>m</sup>4) wide. The inner or southern portion of the west wharf, 1,800 feet (548<sup>m</sup>6) in length, 20 extends along West Street and has a depth of 14 feet (4<sup>m</sup>3). There are three small boat landings in this section. The west wharf continues along West Street 2,000 feet (609<sup>m</sup>6) with 28 feet (8<sup>m</sup>5) of water available. Oil and coal bunkering stations are on this wharf. The east wharf is a concrete wall 2,600 feet (792<sup>m</sup>5) long with 28 feet (8<sup>m</sup>5) of water alongside. There are two small boat 25 landings. Railway and bunkering facilities are available. Vessels should avoid mooring at the nickel company's water intake, which is on the east side, 1,900 feet (579<sup>m</sup>1) south of bridge No. 21.

**Outer Harbour.**—The outer harbour is protected by two breakwaters. The western breakwater is 4,422 feet (1,347<sup>m</sup>8) long, extending from the 30 entrance westerly in the direction of Sugar Loaf Point and terminating in shoal water. It is built of stone filled timber cribwork covered with concrete. A wing, called the western breakwater extension, starting from a point 950 feet (289<sup>m</sup>5) from the east end, runs southerly 2,100 feet (640<sup>m</sup>1). It is built of concrete cribs and concrete superstructure, with rip-rap on the southwest face, and 35 terminates in a concrete pierhead, on which is erected one of the outer lights.

The eastern breakwater starts 625 feet (190<sup>m</sup>5) southeast from the western breakwater and runs easterly 2,400 feet (731<sup>m</sup>5). It is composed of timber and concrete cribwork, with some stone rip-rap protection along its outer face and western end. It should be given a berth of 100 feet (30<sup>m</sup>5).

40 The westerly part of the outer harbour has a limiting depth of 18 feet (5<sup>m</sup>5), except the channel 250 feet (76<sup>m</sup>2) wide and 19 feet (5<sup>m</sup>8) deep, to the Government elevator. The southerly side of this channel is marked by a black spar buoy. Two piers, each 600 feet (182<sup>m</sup>9) long by 200 feet (61<sup>m</sup>0) wide, form an extension southward from the west wall of the channel. A slip between 45 them is 600 feet (182<sup>m</sup>9) long and 200 feet (61<sup>m</sup>0) wide. The eastern side of this slip has a limiting depth of 16 feet (4<sup>m</sup>9). The eastern pier is occupied by the Maple Leaf Milling Company and the Ontario Bag Company; on the western pier is the Government grain elevator. The latter has a capacity of 50 3,000,000 bushels and that of the Maple Leaf Milling Company 2,250,000 bushels.

Charts 2042, 2174.

**Buoys.**—The outer harbour has a limiting depth of 28 feet (8<sup>m</sup>5) in the main channel, the sides of which are marked by red spar and black spar buoys. A red spar buoy marks the western side of the channel at its junction with that leading to the Government elevator.

5

**Cribs.**—The outer portion of the east side of the Ship Channel is marked by isolated cribs, the south prolongation of the line running about 100 feet (30<sup>m</sup>5) west of the eastern breakwater. There is a *flashing green* light on the southernmost crib.

**Lights.—Fog signals.—Radiobeacon.**—A light is exhibited, at an elevation of 36 feet (11<sup>m</sup>0), from a white, square structure at the outer end of the western breakwater extension at Port Colborne. A strong beam of light shows over an arc of 30°, covering the approach from the turning buoy, with the secondary light visible from the harbour side.

10

A fog signal is sounded at the light station.

15

A light is exhibited, at an elevation of 50 feet (15<sup>m</sup>2), from a white, square building, on the eastern end of the west breakwater.

A fog signal is sounded at the light station and a radiobeacon is operated.

A light is exhibited, at an elevation of 24 feet (7<sup>m</sup>3), from a pyramidal beacon with red steel superstructure on the western end of the eastern breakwater at Port Colborne. Vessels should not approach nearer than 100 feet (30<sup>m</sup>5) to this light.

20

**Buoyage.**—A black light-buoy, showing a *flashing white* light, is moored at the southeastern end of the dredged channel, opposite the outer end of the west breakwater extension. Northward of this, the eastern side of the channel is marked by black spar buoys.

25

**Light-and-bell-buoy.**—A light-and-bell-buoy, showing a *flashing white* light, painted in black and white vertical stripes, and fitted with a radar reflector, is moored about 3 miles, 208° from the outer light on the west breakwater at Port Colborne.

30

**Radio-telephone.**—Masters of vessels entering Port Colborne Harbour from Lake Erie, which are equipped with radio-telephone, shall telephone station VBX at the guard gate, when the vessel approaches Port Colborne light-and-bell-buoy (turning buoy). They shall inform the Lockmaster at the guard gate as to the destination of the vessel.

35

The following frequencies are assigned to this station for communications with vessels:

2182 Kc/s.—For calling and distress purposes only.

2158/2550 Kc/s—For transmission to U.S. Ship stations after communication has been established on the calling frequency.

40

2206/2582 Kc/s—For transmission to Canadian Ship stations after communication has been established on the calling frequency.

2118/2514 Kc/s—General.

45

Masters of vessels northbound in the canal from Port Colborne may obtain information as to whether or not the guard gate is ready to pass the vessel by calling VBX. It is important that masters of vessels use the frequency

*Charts 2042, 2174.*

2182 Kc/s for calling VBX only. Once communication has been established, further transmission must be made on the frequencies provided for that purpose on the ship's radio-telephone transmitter.

5      **Note.**—The illuminated chimney of the International Nickel Company at Port Colborne serves as a *fixed white* light, 500 feet (152<sup>m</sup>4) high and visible 10 miles.

## CHAPTER VIII

### NIAGARA FALLS

#### NIAGARA FALLS TO LAKE ERIE

*United States charts 256, 312.*

From Niagara Falls to Lake Erie is about 20 miles by the shortest channel. For a distance of about 3 miles, to Navy Island, the river flows through a single channel from 4,000 to 7,500 feet (1,219<sup>m</sup>2 to 2,286<sup>m</sup>0) wide. Along the first mile of this section are the intake works of the various hydro-electric plants developing power at the falls. 5

**Chippawa** is situated at the junction of the Welland and Niagara Rivers, 10 1<sup>1</sup><sub>2</sub> miles above the falls. A cut 1,020 feet (310<sup>m</sup>9) long, extending from a point near the mouth of the Welland River, was dredged out into the Niagara River, to a depth of 10 feet (3<sup>m</sup>0), but is now considerably filled up. The current in the Niagara River, at the entrance, is very swift.

**Welland River** is from 50 to 100 feet (15<sup>m</sup>2 to 30<sup>m</sup>5) in width. The 15 navigable depth from the Niagara River to a point about 4 miles upstream is 30 feet (9<sup>m</sup>1) and from there to Port Robinson, on the Welland Canal, it is about 6 feet (1<sup>m</sup>8). The lower four miles is now utilized by the Ontario Hydro-electric Power Commission as part of its canal for diversion of water from the Niagara River. At the river mouth are the intake structures incident thereto, on the 20 south of which is a ship channel affording entrance to the small harbour.

**Niagara Falls, New York**, has a harbour behind **Connors Island**, about 2<sup>1</sup><sub>2</sub> miles above the falls, with an approach channel dredged to 12 feet (3<sup>m</sup>7). This is the **Schlosser Channel**. Vessels may with caution approach the docks at Niagara Falls drawing 11 feet (3<sup>m</sup>4) of water. 25

**Light.**—A light is exhibited, at an elevation of 16 feet (4<sup>m</sup>9), from an iron pole on the northern side of the entrance to the Welland River (*Lat. 43° 04' N., Long. 79° 03' W.*) This light defines the danger zone above Niagara Falls.

**Grand Island**, entirely in United States territory, occupies the greater part of the upper Niagara River and is 7 miles long north and south and almost 30 that in width. The International Boundary follows the Chippawa, or Canadian Channel, closely skirting the western shore of Grand Island, and, consequently, Chippawa Channel is within Canadian territory.

East of Grand Island is the **Tonawanda**, or **American Channel**, narrower, but dredged, and improved, and giving access by water from Lake Erie to the 35 waterfront of **Tonawanda City**, New York, and the entrance, at this point, of the Erie Canal, by way of **Tonawanda Creek**.

**Erie Canal.**—This is part of the New York State barge canal system. It provides through water communication from Buffalo and the Niagara River for 338 miles to the Hudson River at Troy by means of 35 locks and improved 40 reaches, with a channel 12 feet (3<sup>m</sup>7) deep. The usable dimensions of the locks

*United States charts 256, 312.*

are 300 feet (91<sup>m</sup>4) long and 43<sup>1</sup><sub>2</sub> feet (13<sup>m</sup>3) wide, with 12 feet (3<sup>m</sup>7) of water over the mitre sills. The least vertical overhead clearance of bridges spanning the canal, above the maximum navigable elevation of the water surface, is 15

5 feet (4<sup>m</sup>6).

No tolls are charged on the Erie Canal.

**Chippawa Channel** lies between Grand Island and the Canadian shore and extends from Navy Island to Strawberry Island, a distance of 11 miles. It is from 650 to 1,500 yards (594<sup>m</sup>3 to 1,371<sup>m</sup>6) wide, except at Navy Island,

10 where it is contracted to 450 yards (411<sup>m</sup>5). There is a good channel on either side of Navy Island. Using the channel east of Navy Island, favour the Navy Island shore, to avoid a shoal extending one-quarter of a mile, 293° from the northwestern point of Grand Island. Chippawa Channel is rarely used except by excursion steamers. The limiting depth is 13 feet (4<sup>m</sup>0). The International

15 Boundary passes through this channel.

*United States charts 314, 256, 312.*

From Grand Island to Lake Erie, the improved channel in the open river was formerly dredged to 14 feet (4<sup>m</sup>3) and 400 feet (121<sup>m</sup>9) wide, except for a quarter of a mile at Buffalo waterworks old intake crib, where the width is

20 only 100 feet (30<sup>m</sup>5). This reach is characterized by strong and variable currents and the bottom is generally rocky. The channel has shoaled in places since its completion, a survey showing a number of spots with from 10 to 14 feet (3<sup>m</sup>0 to 4<sup>m</sup>3) of water on them; great care should be used in navigating it and in passing the old intake crib.

25 **Bridge.**—The International Bridge, a single track railroad bridge, crosses the Niagara River at the lower or north end of Buffalo. The fixed spans have a clear height of 22 feet (6<sup>m</sup>7) above low-water datum. The draw, situated in the main channel near Squaw Island, is a swing span with clear openings of 154 feet (46<sup>m</sup>9) on the east and 156 feet (47<sup>m</sup>5) on the west side. The depth

30 is 23 feet (7<sup>m</sup>0) through the west opening, but only 9 feet (2<sup>m</sup>7) through the east opening. A tug is maintained by the bridge company to assist vessels in getting through, as the water, near the draw, is very swift.

35 **Lights.**—There are three lights, on iron columns, standing at the centre and at each end of the swing span, 15 feet (4<sup>m</sup>6) above the top chord. The centre light is 15 feet (4<sup>m</sup>6) higher than the others. These lights show *red* when the bridge is closed and *green*, up and down stream, when the bridge is open. There are *red* lights near the top of the abutments of both draw openings and *red* lights on both ends of the pivot piers.

40 **Signals.**—The signal for opening the draw is *one long* blast of the whistle. The signals from the bridge are as follows: *one long* blast when the bridge is to be opened; *two short* blasts when the bridge is closed and locked; *four short* blasts summon the tug when the bridge is disabled, and at the same time, a *red* flag or *red* light is shown on the flagstaff on top of the bridge over the west draw opening.

45 **Fog signal.**—Blasts of *ten seconds* duration are made at intervals of *ninety seconds*.

50 **Dock.**—Just below the International Bridge is the concrete dock of the Fort Erie Dock Co. Ltd., 160 feet (48<sup>m</sup>8) long, parallel to the stream, with a depth of 12 feet (3<sup>m</sup>7) along the face when the river is at an elevation of 568.0 feet (173<sup>m</sup>1).

*United States charts 314, 256, 312.*

**Peace (Fort Erie-Buffalo) Bridge.**—A high level roadway bridge crosses the upper Niagara River,  $1\frac{1}{4}$  miles above the International Bridge. The span over Black Rock Canal has a height of 100 feet ( $30^m5$ ) above low water datum and clear width of 341 feet ( $103^m9$ ) at right angles to the channel. The river spans are from 365 feet to 423 feet ( $111^m3$  to  $128^m9$ ) wide, in the clear, with heights at centre of the arches (increasing from the Canadian to the United States side) of from  $91\frac{1}{2}$  to  $56\frac{1}{2}$  feet ( $27^m8$  to  $17^m2$ ). The height at centre of span over the usual vessel course is  $67\frac{1}{2}$  feet ( $20^m5$ ).

**Fort Erie Town**, about a mile above Bridgeburg, is at the Canadian end 10 of the Peace bridge. There is steam ferry service between this place and Buffalo. The Canadian Niagara Power Company electric transmission cables, with clear headroom of 137 feet ( $41^m8$ ), cross about 1,000 feet ( $304^m8$ ) below the bridge.

The ruins of Fort Erie lie close to the water's edge, about  $1\frac{1}{4}$  miles above 15 the Peace Bridge. A monument has been erected on the eastern side of the old fort.

**Light.**—A light is exhibited, at an elevation of 30 feet ( $9^m1$ ), from a lantern on a crib, about 100 yards ( $91^m4$ ) below the Peace Bridge.

Above Fort Erie the river widens rapidly and, at its entrance, is nearly 20 2 miles in width.

**Limekiln Reef** lies with its shoalest spot of 6 feet ( $1^m8$ ) of water, about one mile above the Peace bridge and about three-eighths of a mile offshore.

**Bird Island Reef** extends from the breakwater on the United States shore, for 1,500 feet ( $457^m2$ ), to a depth of 6 feet ( $1^m8$ ) abreast the shoalest 25 spot on Limekiln Reef.

**Buoys.**—A red spar buoy is moored just outside this danger and another red spar buoy is located on the edge of the channel, a quarter of a mile upstream.

**Twelve-foot Shoal** lies immediately above Limekiln Reef, its shoalest 30 spot of 11 feet ( $3^m4$ ) lying  $127^\circ$ , distant three-eighths of a mile from Fort Erie monument.

**Middle Reef** is about in mid-river at its entrance, and its shoalest spot has less than one foot ( $0^m3$ ) of water on it.

**Buoys.**—A red spar buoy is moored  $087^\circ$ , distant five-eighths of a mile 35 from the outer end of Erie Beach dock, just outside a wreck on Middle Reef.

A red light-buoy, No. 2A, showing a *flashing white* light, marks the south-western limit of Middle Reef Shoal.

**Currents of Niagara River.**—The current of the river at its head begins near Middle Reef. For about  $1\frac{3}{4}$  miles, the river is wide, shallow and rocky and the current is from 2 to 3 miles per hour. Thence for about 2 miles it follows the engorged section, beginning about one-eighth of a mile above the Buffalo waterworks old intake crib and extending past the International Bridge for a half mile to the foot of Squaw Island. This engorged section is from 1,600 to 2,000 feet ( $487^m7$  to  $609^m6$ ) wide, the narrowest part being the upper three-quarters of a mile in the vicinity of the old waterworks crib, at which point 40 45

*United States charts 314, 256, 312.*

the velocity of the current is estimated to be 4 to 5 miles per hour at low to mean stages of the river and 5 to 7 miles per hour at high stages. From a point about five-eighths of a mile below the old waterworks crib to the foot of

5 Squaw Island, the channel is deep, somewhat wider, and the current less rapid than at the narrowest part of the gorge section. Numerous observations of the current velocity, made at and just below the International Bridge, in connection with river discharge work, determine the velocity, near midstream, to be 4 miles per hour at low to mean stages and  $4\frac{3}{4}$  to 5 miles per hour at high stages.

10 The two channels around Strawberry and Grand Islands have currents varying from 1 to 4 miles per hour.

**Directions for Niagara River.**—Approaching the entrance to Niagara River, when almost abeam Buffalo intake crib light, and 2,500 feet (762<sup>m</sup>0) west of it, an 029° course should be steered, which leads between the red spar buoy on

15 Middle Reef and Twelve-foot Shoal on the eastern side of the channel. Hold this course until abreast the red spar buoy moored a quarter of a mile above Bird Island Reef and then alter course to 019° and steer to pass through the channel span of Peace Bridge and to westward of the *quick-flashing red* light marking the intake crib. There is a current here of about 6 miles per hour.

20 Now steer for the International Bridge and pass through on the west side of the swing pier. The current here is 5 miles per hour.

**Caution.**—The above channel should be used only by light-draught vessels. The Black Rock Canal is the recommended deepwater route from Lake Erie to the foot of Squaw Island.

25 After passing the International Bridge, the Tonawanda Channel should be followed. The recommended routes for the Niagara River are entirely in American waters.

*United States chart 314.*

**Buffalo Harbour**, located at the eastern end of Lake Erie, where it converges to an open and comparatively shallow bay about 8 miles across north and south, is subject to great storms from the southwest.

The outer harbour, 4½ miles long and 1,600 feet (487<sup>m</sup>7) wide, is protected by a system of breakwaters extending from Stony Point (*Lat. 42° 50' N. Long 78° 52' W.*) on the south to the head of the Niagara River on the north, with

35 two entrance channels, at the north and south ends. The inner harbour comprises the Buffalo River, the City Ship Canal and various basins and slips. An entrance channel at the mouth of the Buffalo River leads into the inner harbour. Depths of 21 to 23 feet (6<sup>m</sup>4 to 7<sup>m</sup>0) have been provided, where necessary, in the outer harbour and channels.

40 The harbour area is all good anchorage ground, except that the bottom south of the middle gap is very soft clay, and there are very limited mooring facilities along part of the breakwater. There are mooring rings on nearly 5,000 feet (1,524<sup>m</sup>0) of the old breakwater adjoining the north harbour entrance, and on 1,800 feet (548<sup>m</sup>6) of the south breakwater adjoining the south harbour

45 entrance.

Vessels are allowed to moor to the breakwaters with manila lines, but not with wire ropes or chains.

The outer harbour is also used as a channel way by lake vessels, but Masters are warned not to approach closer than 100 feet (30<sup>m</sup>5) to the breakwaters,

50 as there is danger of striking the stone riprap within this limit.

*United States chart 314.*

There is very little current in the outer harbour except during sudden fluctuations of water level, which may cause considerable current, especially in the entrance channels.

**Lights.—Fog signals.—Radio Beacons.**—A light is exhibited, at an elevation of 65 feet (19<sup>m</sup>8), from a white, square tower, at the northern end of the breakwater on the south side of the northern entrance to Buffalo Harbour. It is known as Buffalo light.

A fog signal is sounded at the light, and a radio beacon, which is synchronized with the fog signal for distance finding purposes, is operated at the 10 station.

A light is exhibited, at an elevation of 36 feet (11<sup>m</sup>0), from a white bottle-shaped structure, on the southern end of the North Breakwater.

A light is exhibited, at an elevation of 53 feet (16<sup>m</sup>2), from a white and brown conical structure, known as South Side light, on the breakwater on the 15 south side of the southern entrance to Buffalo Harbour.

A fog signal is sounded at the station and a radio beacon is operated.

A light is exhibited, at an elevation of 43 feet (13<sup>m</sup>1), from a white, skeleton tower with enclosed base, from the outer end of Stony Point Breakwater.

A fog bell is sounded at the light station.

A light is exhibited, at an elevation of 40 feet (12<sup>m</sup>2), from a white, bottle-shaped structure on the southern end of the breakwater at the northern side of the south entrance to Buffalo Harbour. It is known as North Side light.

A light (*Lat. 42° 53' N., Long. 78° 55' W.*) is exhibited, at an elevation of 60 feet (18<sup>m</sup>3), from a circular building on a concrete crib. This light is 25 known as Buffalo Intake light.

**Anchorage light.**—A light is exhibited, at an elevation of 21 feet (6<sup>m</sup>4), from a lantern on a pipe, on the breakwater 400 yards (365<sup>m</sup>8) southeastward of Buffalo light. The light is only visible inside the breakwater from 140° to 330°. Vessels are requested not to anchor northward of this light.

**Storm signals.—Lifeboat.**—A coast Guard lifeboat station is situated on the south pier at the mouth of the Buffalo River. Day and night storm signals are displayed from a steel tower at the lifeboat station and also from a steel tower at the southern entrance at the northern end of the Bethlehem Steel Company's Lackawanna plant.

**Submarine cable.**—A submarine electric power cable crosses the north end of the outer harbour in a straight line between a point about 20 feet (6<sup>m</sup>1) south of Buffalo light foundation and the outer end of the south pier. A sign lettered "Cable—Do Not Anchor", is at the shore end of the cable, and another sign, lettered "Cable Crossing 100 Ft. South", is at the edge of the main deck 40 of Buffalo lighthouse, facing northerly.

**Light-buoys.**—The northwest side of the north entrance is marked by two black light-buoys each showing a *flashing white* light.

A red light-and-bell-buoy is moored on the southeastern side of the north entrance, showing a *flashing red* light.

**South entrance.**—The approach to this entrance is clear, with a least depth of 25 feet (7<sup>m</sup>6). The available width of the entrance is 550 feet (167<sup>m</sup>6) between the south end of the south harbour section and the protection arm of Stony Point section of the breakwater; the depth is 25 feet (7<sup>m</sup>6).

## United States chart 314.

**Lackawanna Canal.**—The approach from the southern entrance to the mouth of the Lackawanna Canal is 1,900 feet (579<sup>m</sup>1) long, with a least depth of 25 feet (7<sup>m</sup>6). Two private *fixed red* lights mark the mouth of the canal, 5 one on the Steel Company's dock on the easterly side, and one opposite on the westerly side of the entrance. This canal is 25 feet (7<sup>m</sup>6) deep and 3,800 feet (1,158<sup>m</sup>2) long from the southerly end of the outer harbour into the Bethlehem Steel Company's Lackawanna plant at Stony Point. Attention is directed to the fact that the five unloading machines on the Company's dock overhang the 10 face of the canal wall 14 inches (0<sup>m</sup>4), and vessels must exercise considerable care in approaching and leaving the dock to avoid striking the machines.

**Union Canal.**—The approach from the south entrance to the Union Canal is 2,000 feet (609<sup>m</sup>6) long, through a least depth of 25 feet (7<sup>m</sup>6). The canal is 16 to 19 feet (4<sup>m</sup>9 to 5<sup>m</sup>8) deep, 220 feet (67<sup>m</sup>1) wide and about 4,000 15 feet (1,219<sup>m</sup>2) long, and extends into the properties of the Lehigh Portland Cement Company, the Pennsylvania Railroad and the Hanna Furnace Company, about 600 feet (182<sup>m</sup>9) north of the south city line. A *fixed red* light is shown on a pole on the south side of the entrance to this canal.

**Bridge.**—The Hamburg turnpike bridge across the Union Canal has a 20 single-leaf lift 9.1 feet (2<sup>m</sup>7) high above low water datum, 80 feet (24<sup>m</sup>4) clear width of opening; operated by electricity. Signal for opening draw, three blasts. *Red* lights on centre of bridge show in either direction. *Red* lights show on each abutment.

**Pillsbury Mills Inc.**—The slip of this company is located about 2,000 feet (609<sup>m</sup>6) north of the Union Canal and is 800 feet (243<sup>m</sup>8) long, 120 feet (36<sup>m</sup>6) wide, and 22 feet (6<sup>m</sup>7) deep. The elevator has a capacity of 2,000,000 bushels.

**Merchants Refrigerating Co.**—The slip of this company, in the outer part of the harbour about 6,000 feet (1,828<sup>m</sup>8) northward of the southern 30 entrance, is 75 feet (22<sup>m</sup>9) wide, 1,550 feet (472<sup>m</sup>4) long, and with depths decreasing from 23 feet (7<sup>m</sup>0) at the outer end to 17 feet (5<sup>m</sup>2) at the inner end.

**Ford Motor Company.**—The slip of this company is located just north of the Merchants Refrigerating Co. wharf and is 1,000 feet (304<sup>m</sup>8) long, and 200 feet (61<sup>m</sup>0) wide, and 20 feet (6<sup>m</sup>1) deep.

**Shipyard and Dry Docks.**—The American Ship Building Co. has extensive works on the south side of the Buffalo River, one mile from the mouth, with two dry docks. The Great Lakes Dredge and Dock Co. has a floating dock on the north side of Buffalo River, at the foot of Katherine Street. Dimensions of these docks are given in the table following:

40

## American Ship Building Co.

	No. 1	No. 2
	Feet	Feet
Length over all .....	470	630
Length on keel blocks .....	441	578
Width at bottom .....	58.2	71.8
Width at top .....	58.2	78.7
Width at entrance .....	58.2	71.8
Depth available .....	12.0	13.0

Charts 314, 256, 312.

## Floating Docks

	Great Lakes Dredge and Dock Co. Feet
Length over all .....	158
Clear inside width .....	53
Will admit vessels of size—	
Length .....	158
Width .....	50
Draught .....	12

United States chart 314.

**Gauge.**—On the northerly face of Buffalo light foundation is a staff water gauge marked every 2 feet (0<sup>m</sup>6) with raised block letters one foot (0<sup>m</sup>3) high. The bottom of the zero mark is at low water datum. The figures are orange colour on a white background. The spaces between the figures are marked in black and white diagonal stripes. Illumination at night is provided for by a light over the cable crossing sign at the edge of the main deck of Buffalo light. A similar gauge is fitted to the South Side light foundation at the southern entrance.

5

10

**Black Rock Canal** is an artificial waterway 3½ miles long leading along Buffalo waterfront from the outer harbour into the Niagara River and is an essential part of the improvement of the latter. The Black Rock Canal is the recommended deepwater route from Lake Erie to the Niagara River.

Chart 2174.

15

**Light-buoy.**—**Seneca Shoal**, with 13 feet (4<sup>m</sup>0) at its northerly edge lies about 4 miles westward of the east, or Buffalo shore of the lake; it is in United States waters and marked by a red light-buoy, showing a *flashing red* light.

**Coast.**—From the entrance to Niagara River to Point Abino, the coast is a succession of shallow bays and points with shoal water, under 3 fathoms (5<sup>m</sup>5), extending offshore from three-quarters to 1½ miles.

**Fort Erie Beach** is a summer resort at the head of the Niagara River. Shoal water extends half a mile off Erie Beach.

**Wharf.**—The excursion company owners maintain a wharf, with a depth alongside of 14 feet (4<sup>m</sup>3). There is no landing for small boats at this wharf, but there is a landing for them at a wharf one-third of a mile to the westward.

25

This locality is exposed to southwesterly storms. The anchorage is poor, the bottom consisting of rock.

**Waverly Shoal**, lying in the approach to the Niagara River, has a least depth of 13 feet (4<sup>m</sup>0), 194° distant 1½ miles from the outer end of Erie Beach dock. From this spot, the shoal, under a depth of 3 fathoms (5<sup>m</sup>5) extends about a mile southwestward and 1,200 feet (365<sup>m</sup>8) northeastward and its greatest width is about 1,200 feet (365<sup>m</sup>8).

30

**Buoy.**—A black can buoy is moored, in 16 feet (4<sup>m</sup>9) of water, close southward of the shoalest spot on Waverly Shoal.

35

## Chart 2174.

**Light-and-bell-buoy.**—A black, conical light-and-bell-buoy, fitted with a radar reflector and showing a *flashing green* light, is moored  $1\frac{1}{4}$  miles south of the black can buoy, in 30 feet (9<sup>m</sup>1) of water. This buoy is moored a quarter 5 of a mile north of the junction of the charted sailing courses for Lake Erie.

**Shoals.**—A spot, with a depth of 22 feet (6<sup>m</sup>7) over it, lies  $300^{\circ}$ , distant 400 feet (121<sup>m</sup>9) from the light-buoy and another spot, with 23 feet (7<sup>m</sup>0), lies  $122^{\circ}$ , distant 2,600 feet (792<sup>m</sup>5) from the same buoy. A spot, with 20 feet (6<sup>m</sup>1) over it, lies  $325^{\circ}$ , distant 2,700 feet (823<sup>m</sup>0) from this buoy.

10 Abreast Waverly Shoal, the shoal water extends from the Canadian shore, outside **Roses Reef**, for about three-quarters of a mile. Roses Reef is the rocky shoal water off the point, a half mile west of Erie Beach dock.

15 **Windmill Point** lies  $4\frac{1}{2}$  miles west of the entrance of the Niagara River. The shallow shorebank has its greatest width of  $1\frac{1}{2}$  miles off this point. A stone windmill stands on the extremity of the point. Just east of the point are the 15 ruins of a wharf, and there is a small wharf just west of the point.

20 **Crystal Beach**, a summer resort  $2\frac{1}{4}$  miles to the westward of Windmill Point, has shoal water extending off half a mile. The anchorage is good with sandy bottom, but exposed to southwesterly storms. The bay between Crystal Beach and Point Abino is shallow and sandy.

**Wharf.**—The Lake Erie Excursion company maintains a wharf for its excursion steamers of not over 12 feet (3<sup>m</sup>7) draught. There is a landing for small boats on the east side of the wharf.

25 **Point Abino** is about 9 miles southwestward of the head of the Niagara River. It is the extremity of a peninsula, projecting south from the main coastline about 2 miles, and attaining an elevation of 100 feet (30<sup>m</sup>5) near the outer end. Shoal water extends off the point about half a mile.

**Wharf.**—There is a small wharf in the northwest corner of the bay, used by the Buffalo Canoe Club.

30 **Light.—Fog signal.**—A light is exhibited, at an elevation of 87 feet (26<sup>m</sup>5), from a white, square tower, on the southern extremity of Point Abino. A fog signal is sounded close northwestward of the light-tower.

35 **Coast.**—Northwest, 3 miles from Point Abino is a low point, with an abandoned quarry and wharf, known as **Shisler Point**, a mile and a half back from which is the post office and railway station of **Sherkston**.

From Point Abino westerly for about 8 miles to Gravelly Bay, the shore is bordered by a rocky shoal varying in width from one-half to one mile, and attaining its greatest width off the easterly point of Gravelly Bay.

(For continuation of description of the Canadian shore of Lake Erie from 40 Port Colborne, which is  $7\frac{1}{4}$  miles westward from Point Abino, see page 124).

CHAPTER IX  
LAKE ERIE  
DIMENSIONS, ELEVATIONS, ETC.

*Chart 2100.*

<b>Length</b>	Clear of Point Pelee and Long Point.....		241 miles		
<b>Breadth</b>	Point Talbot to Ashtabula.....		57 miles		
<b>Depth</b>	Maximum recorded (Bottom 363 feet <b>Above</b> M.S. Level)..... Latitude 42° 30' N., Longitude 80° 00' W..... Average.....		210 feet 60 feet		
<b>Rainfall</b>	Average annual (1890-1954).....	34.28	inches		
<b>Area</b>	Water Surface..... Local Drainage Basin..... Entire Drainage Area.....	U.S. 4,990 23,570 157,340	Canada 4,950 11,110 106,120	Total 9,940 34,680 263,460	square miles square miles square miles
<b>Elevations</b>	In feet above M.S. Level referred to U.S.L.S. datum of 1903 adjustment and B.M. "Steel Rivet" at Port Colborne, Ontario.....		Elev. 584.657		
<b>Recorded</b>	At Port Colborne 1860 to 1955.				
<b>High Water</b>	of 1838..... Highest month since 1860 (Mean of July 1862).....		Elev. 575.11 Elev. 574.80		
<b>Low Water</b>	Lowest month since 1860 (Mean of February 1935)..... Datum for Canadian harbour improvements..... Datum for Canadian charts.....		Elev. 569.39 Elev. 570.50 Elev. 570.50		
<b>Mean Level</b>	1860 to 1956 inclusive (97 years)..... Below mean level of Lake Huron..... Above mean level of Lake Ontario.....		Elev. 572.38 8.22 326.45		
<b>Max. Range</b>	In yearly mean levels 1860 to 1956 inclusive (1862, 574.07 to 569.90, 1934)..... In monthly mean levels 1860 to 1952 inclusive (1862 July 574.80 to 569.39 February 1935)..... In monthly mean levels of one calendar year (1917 February 571.14 to 573.71 July).....		4.17 5.41 2.57		
<b>Min. Range</b>	In monthly mean levels of one calendar year (1911 February and March 571.25 to 572.00 June).....		0.75		
<b>Elevations</b>	(40 yrs. 1860-1899).....	(57 yrs. 1900-1956).....	(97 yrs. 1860-1956).....		
<b>Mean</b>	572.87	571.97	572.36		
<b>Max. Year</b>	574.07 (1862)	573.80 (1952)	574.07 (1862)		
<b>Min. Year</b>	571.26 (1895)	569.90 (1934)	569.90 (1934)		
<b>Max. Month</b>	574.80 (July 1862)	574.54 (May 1952)	574.80 (July 1862)		
<b>Min. Month</b>	570.77 (Mar. 1896)	569.39 (Feb. 1935)	569.39 Feb. 1935		
<b>Mean Level</b>	1860-1869 573.31 1860-1879 573.13 1860-1889 573.13 1860-1899 572.87 1860-1909 572.75 1860-1919 572.65 1860-1929 572.51 1860-1939 572.34 1860-1949 572.33 1860-1956 572.38	<b>Mean Level</b>	1860-1869 573.31 1870-1879 572.94 1880-1889 573.13 1890-1899 572.09 1900-1909 572.25 1910-1919 572.15 1920-1929 571.68 1930-1939 571.17 1940-1949 572.24 1950-1956 573.06		

## Chart 2100.

**Harbours.**—Originally a few harbours were formed by natural bays, but for the most part the harbours were found within the mouths of streams and were obstructed by bars at the entrance; numerous harbours have been improved 5 to accommodate the present large lake vessels, by dredging the entrance and inner harbour channels and protecting them by piers and revetments, and by constructing breakwaters into the lake and deepening the enclosed areas to afford anchorage and mooring facilities and form commodious harbours outside the contracted basins within the streams.

10      **Navigation and Commerce.**—The commerce of the lake nearly all centres at the mouth of the Detroit River, from which it radiates to the Welland Ship Canal, Niagara River, and the intermediate lake ports. The greater portion of traffic proceeds to the north of the island region, in the western end 15 of the lake, through Pelee Passage between Point Pelee and Pelee Island, this is the most important channel of the lake and is suitably marked by aids to navigation.

Lake Erie is a connecting link in the chain of the Great Lakes, receiving the waters of the upper lakes through the Detroit River, and discharging into Lake Ontario through the Niagara River. The depth of water at the Limekiln 20 crossing in the Detroit River, originally about 13 feet (4<sup>m</sup>0), has always limited the size and draught of vessels navigating to and from Lake Erie to the upper lakes; the improvement of the Ship Channel connecting Lake Erie and Lake Huron (the so-called 20- and 21-foot (6<sup>m</sup>1 and 6<sup>m</sup>4) channels begun in 1892), has permitted the introduction of larger vessels, with corresponding increased 25 draught, which can pass with safety and speed through Lake Erie. Until the opening of the new Welland Ship Canal, in 1931, the larger vessels were forced to restrict their easterly limits to Lake Erie; since then, the easterly limits of navigation, for the larger vessels, has been extended, into the upper St. Lawrence River, an additional 245 miles towards tidal waters.

30      **Lake levels.**—The surface elevation of Lake Erie is never constant, being subject to changes from mechanical and natural agencies, such as have been described for Lake Ontario. See page xxvii.

Due to the fact that high and low centres of barometric areas do not, as a rule, pass directly over this body of water, the "seiches", or purely barometric 35 engendered oscillations, are not generally of large range on Lake Erie. However, the raising of the water-level on the lee shore, and the lowering of the weather shore level, are very pronounced because the shallow water of this lake afford less opportunity than in deeper lakes, for the impelled surface water to return by means of reverse currents beneath the disturbed depths, to the weather shore.

40      An excellent illustration of Lake Erie water piling-up on a lee shore occurred during a gale centering on December 8, 1927. (See table, page 123, of maximum and minimum water surface elevations of Lake Erie at Port Colborne, Ontario.)

45      **Wind.**—On December 7, 1927, the wind velocity ranged from 20 to 30 miles per hour from the southeast; during the first hour of December 8 the direction veered to the southwest and the velocity had increased to 86 miles at 6 a.m., an average of 80 miles being maintained until 2 p.m., from which time the direction changed to west and the velocity diminished by 30 miles within an hour and an average of 40 to 50 miles per hour until noon of December 50 9, from which it fell to 20 miles per hour, by midnight, still from the west.

## Chart 2100.

**Water-levels.**—On December 7 the water-level, at Port Colborne, was about normal; at 2 a.m. December 8 the water-level started to pile up rapidly, about 2 feet ( $0^{\text{m}}6$ ) per hour, reaching the maximum elevation of 578.58 feet ( $176^{\text{m}}4$ ) at 7.58 a.m., followed by a sharp recession, about three-quarters of a foot ( $0^{\text{m}}3$ ) per hour, until 3 p.m., from which time the level remained from one to 2 feet ( $0^{\text{m}}3$  to  $0^{\text{m}}6$ ) above normal until late on December 9, after which it gradually lowered to the normal plane. During this gale the water-level at Amherstburg, in the Lower Detroit River, fell to a minimum of 4.62 feet ( $1^{\text{m}}4$ ) below the average level at 11.20 a.m., December 8. Note that the maximum elevation at Port Colborne was slightly higher than the level of Lake Huron at Goderich and 11.43 feet higher than the minimum elevation at Amherstburg. It is also to be remarked that the water-level started to rise at Amherstburg about 3 hours before, and at Port Colborne to recede about 6 hours before the average peak of wind velocity definitely diminished at Port Colborne. During this gale the water-level at Buffalo, N.Y., reached a maximum level of about one and one-half feet ( $0^{\text{m}}5$ ) higher than at Port Colborne, and approximately one hour later.

**Precise water-levels records.**—Self-registering gauges are maintained all year at Port Colborne and Port Stanley, from which continuous surface elevations of Lake Erie are available. The latest water-level data, with statistical analysis, are given in the monthly and annual bulletins issued by the Hydrographic Service.

On the Detroit River, Lake St. Clair and River St. Clair, similar self-registering gauges are also maintained all year by the Hydrographic Service, at LaSalle, Tecumseh, Port Lambton, and Point Edward.

**Season of navigation.**—The season of navigation, generally speaking, is from April 15 to December 15. However, navigation at the westerly end and in the Detroit River may open two to four weeks earlier.

## Chart 2100.

WATER SURFACE ELEVATIONS OF LAKE ERIE (COVERING PERIOD OF NAVIGATION APRIL TO NOVEMBER, INCLUSIVE) IN FEET ABOVE MEAN SEA-LEVEL, FOR THE YEARS 1860 TO 1952

Year	Height in Feet	Highest		Lowest		Year	Height in Feet	Highest		Lowest	
		Mon.	Height	Mon.	Height			Mon.	Height	Mon.	Height
1860	574.04	June	574.68	Oct.	573.50	1905	572.64	July	573.23	Apr.	571.87
1861	574.24	May	574.53	Apr.	573.84	1906	572.33	July	572.55	Apr.	572.07
1862	574.29	July	574.80	Nov.	573.50	1907	572.82	July	573.19	Oct.	572.62
1863	573.82	May	574.08	Nov.	573.23	1908	572.91	May	573.48	Nov.	572.06
		Aug.	574.08			1909	572.70	June	573.27	Nov.	572.05
1864	573.64	June	574.02	Oct.	573.31	1910	572.40	June	572.85	Nov.	571.89
1865	573.00	June	573.30	Nov.	572.49	1911	571.63	June	572.00	Sept.	571.32
1866	573.29	Oct.	573.64	Apr.	572.87	1912	572.36	June	572.53	Apr.	572.10
1867	573.04	July	573.63	Nov.	572.31	1913	573.05	Apr.	573.66	Nov.	572.25
1868	572.89	June	573.51	Oct.	572.20	1914	572.38	June	572.95	Nov.	571.80
1869	573.18	July	573.81	Apr.	572.51	1915	571.70	Aug.	572.08	Apr.	571.24
1870	573.62	July	574.03	Nov.	573.19	1916	572.39	July	573.02	Nov.	571.70
1871	573.15	June	573.64	Nov.	572.24	1917	573.01	July	573.71	Apr.	572.23
1872	572.19	July	572.53	Apr.	571.58	1918	572.18	July	572.48	Apr.	571.77
1873	572.98	July	573.40	Apr.	572.54	1919	572.93	June	573.55	Oct.	572.33
1874	573.13	June	573.56	Nov.	572.67	1920	572.11	July	572.53	Apr.	571.47
1875	572.82	July	573.02	Apr.	572.43	1921	572.30	May	572.76	Nov.	571.44
1876	574.17	July	574.58	Nov.	573.52	1922	572.18	June	572.66	Nov.	571.43
1877	573.01	July	573.34	Apr.	572.59	1923	571.42	June	571.90	Nov.	570.88
1878	573.41	May	573.75	Nov.	572.86	1924	571.83	July	572.39	Nov.	571.35
1879	572.63	June	572.95	Oct.	572.12	1925	570.85	May	571.09	Oct.	570.63
1880	572.95	July	573.32	Nov.	572.57	1926	571.20	Nov.	571.80	Apr.	570.80
1881	572.84	July	573.26	Sept.	572.52	1927	571.60	June	572.04	Nov.	571.11
1882	573.61	June	574.21	Nov.	572.84	1928	572.09	July	572.56	Apr.	571.81
1883	573.50	July	574.26	Apr.	572.61	1929	573.56	May	574.19	Oct.	572.86
1884	573.66	May	574.12	Nov.	572.98	1930	573.03	May	573.80	Nov.	572.01
1885	573.78	July	574.12	Apr.	572.74	1931	571.22	July	571.60	Nov.	570.88
1886	573.62	June	574.07	Oct.	573.26	1932	571.29	June	571.73	Nov.	570.55
1887	573.60	June	574.16	Nov.	572.75	1933	571.26	June	571.93	Nov.	570.38
1888	572.94	July	573.38	Nov.	572.48	1934	570.02	June	570.20	Nov.	569.61
1889	572.64	July	573.20	Nov.	572.01	1935	570.36	Aug.	570.72	Apr.	569.98
1890	573.35	June	574.08	Oct.	572.80	1936	570.72	May	571.03	Sept.	570.37
1891	572.22	Apr.	572.72	Nov.	571.55	1937	571.79	July	572.57	Nov.	571.09
1892	572.60	July	573.44	Apr.	571.62	1938	571.84	Aug.	572.17	Nov.	571.38
1893	572.56	June	573.26	Nov.	571.89	1939	571.84	June	572.20	Nov.	571.14
1894	572.35	June	572.96	Nov.	572.02	1940	571.68	June	572.09	Apr.	571.21
1895	571.32	June	571.53	Nov.	570.78	1941	571.14	June	571.41	Oct.	570.77
		July	571.53					July	571.41		
1896	571.64	Aug.	572.06	Apr.	571.31	1942	572.06	July	572.36	Apr.	571.63
1897	572.25	July	572.61	Oct.	571.61	1943	573.20	June	573.87	Apr.	572.37
1898	572.38	June	572.78	Nov.	571.80	1944	572.62	June	573.23	Nov.	571.89
1899	572.07	June	572.55	Oct.	571.50	1945	573.10	July	573.51	Apr.	572.68
1900	572.18	June	572.47	Oct.	571.68	1946	572.66	July	573.20	Nov.	572.13
		July	572.47			1947	573.34	June	574.14	April	572.57
1901	571.52	July	571.88	Apr.	571.05	1948	573.07	June	573.67	Nov.	572.24
1902	572.33	July	572.94	Apr.	571.77	1949	572.05	May	572.47	Nov.	571.30
1903	572.66	July	572.95	Nov.	572.05	1950	572.64	May	573.11	Oct.	572.10
1904	573.08	June	573.51	Nov.	572.30	1951	573.34	June	573.72	Oct.	572.74
						1952	573.94	May	574.54	Nov.	572.87
						1953	573.31	June	573.83	Nov.	572.60
						1954	573.29	May	573.63	Sept.	572.91
						1955	573.30	May	573.88	Nov.	572.71
						1956	572.85	June	573.31	Nov.	572.23

Elevations are referred to U.S. Lake Survey datum of 1903 adjustment. Water levels are at their lowest during the early winter months. Standard Low Water, or chart datum, is elevation 570.50 feet. The lowest monthly recorded was 569.61 feet for November 1934. The highest monthly mean recorded was 574.80 feet for July 1862.

## Chart 2100.

## MAXIMUM AND MINIMUM WATER SURFACE ELEVATIONS OF LAKE ERIE, RECORDED EACH YEAR AT PORT COLBORNE, ONTARIO

Elevations are in Feet above Mean Sea-Level, referred to the Lake Survey datum of 1903 adjustment.

Year	Yearly Mean Elev.	Highest recorded			Lowest recorded			Ft Range
		Date	Time	Elev.	Date	Time	Elev.	
1923	571.24	Dec. 31	23 00	575.54	Jan. 6	09 18	568.59	6.95
1924	571.58	Dec. 9	05 28	575.00	Feb. 4	23 45	568.82	6.18
1925	570.69	Mar. 19	09 49	574.54	Jan. 1	13 00	568.95	5.59
1926	570.90	Nov. 10	00 01	575.11	Mar. 31	01 51	568.18	6.93
1927	571.46	Dec. 8	07 58	578.58	Feb. 20	00 21	568.60	9.98
1928	572.00	April 14	19 49	576.85	Mar. 30	10 33	568.62	8.23
1929	573.16	April 1	15 52	579.33	Dec. 18	20 37	569.79	9.54
1930	573.00	Sept. 27	00 35	577.01	Dec. 4	08 03	570.97	6.04
1931	571.15	April 26	20 53	574.01	Mar. 7	17 55	568.65	5.36
1932	571.32	Oct. 11	02 12	575.21	Mar. 22	00 57	569.15	6.06
1933	571.07	Feb. 9	12 56	575.09	Nov. 5	05 52	568.47	6.62
1934	569.90	Dec. 26	16 16	573.14	Nov. 30	09 00	568.17	4.97
1935	570.13	Jan. 17	13 12	574.50	Mar. 7	12 25	567.03	7.47
1936	570.42	April 7	21 10	574.71	Jan. 19	09 51	567.90	6.81
1937	571.54	Nov. 28	19 40	576.12	Mar. 24	19 56	568.56	7.56
1938	571.56	Dec. 27	10 42	576.53	Feb. 19	22 32	568.17	8.36
1939	571.60	Jan. 22	11 08	575.37	Jan. 30	11 00	566.54	8.83
1940	571.38	Nov. 12	01 25	575.92	Feb. 19	00 12	568.96	6.96
1941	571.15	Sept. 25	15 58	576.33	Dec. 26	04 38	568.88	7.45
1942	571.71	Dec. 2	17 27	577.21	Jan. 25	08 37	569.14	8.07
1943	572.84	Jan. 19	12 08	575.76	Mar. 6	06 30	569.70	6.06
1944	572.35	June 24	00 02	575.34	Dec. 11	23 47	569.34	6.00
1945	572.69	Nov. 22	04 40	577.13	Feb. 28	14 01	569.89	7.24
1946	572.53	Feb. 14	09 45	576.57	Dec. 29	11 36	570.12	6.45
1947	572.89	Mar. 25	10 17	577.60	Jan. 30	05 56	568.51	9.09
1948	572.78	Nov. 17	05 42	576.56	Jan. 1	19 42	568.07	8.49
1949	572.02	Jan. 19	08 29	576.66	Dec. 7	17 12	569.24	7.42
1950	572.52	Jan. 14	10 11	577.71	Feb. 13	17 52	569.47	8.24
1951	573.15	Mar. 24	08 53	577.62	Oct. 7	07 54	570.41	7.21
1952	573.80	Jan. 23	00 32	577.37	Nov. 21	23 32	570.95	6.42
1953	573.20	Feb. 21	12 17	577.68	Jan. 8	15 55	570.50	7.18
1954	573.04	Mar. 3	18 09	577.83	Mar. 13	04 26	570.12	7.71
1955	573.25	Mar. 22	20 44	578.58	Dec. 4	04 30	571.19	7.39
1956	572.44	Nov. 21	14 35	577.22	Feb. 16	23 56	569.52	7.70

Standard Low Water, or chart datum, is elevation 570.50 feet.

Highest recorded 1923-1952 was 579.33 feet on April 1, 1929.

Lowest recorded 1923-1952 was 566.54 feet on January 30, 1939.

Range ..... 12.79 feet

## Chart 2174.

Port Colborne to Long Point, by the usual steamer track, is  $46\frac{3}{4}$  miles; by following the shoreline and the sinuosities of Long Point Bay, the distance is over 100 miles.

5      **Port Colborne.**—This harbour is the Lake Erie, and southern entrance to the Welland Ship Canal. It is  $7\frac{1}{4}$  miles westward from Point Abino and located in an unremarkable, shallow bight of the north shore, known as **Gravelly Bay**. The harbour is entirely artificial, with dredged basins and channels, and is protected from the force of the Lake Erie seas by  $1\frac{1}{2}$  miles of concrete breakwater. (A detailed description of Port Colborne is given in Chapter VII, page 108, with the Welland Ship Canal.)

10     **Coast.**—From Port Colborne to Port Maitland, a distance of 17 miles, the coast is broken by points and shallow bays with shoal water extending offshore from one-half to 2 miles.

15     20     **Sugar Loaf Point**, one mile west of Port Colborne, is the low, rocky, west point of Gravelly Bay. Shoal water extends southward from the points for half a mile to a depth of 15 feet ( $4^m6$ ) and a similar distance southwestward to 16 feet ( $4^m9$ ).

25     **The Sugar Loaf**, an isolated knoll covered with trees, is situated half a mile northwestward of Sugar Loaf Point. It is 141 feet ( $43^m0$ ) high, and is rendered conspicuous by its sugar loaf shape and tall trees.

30     **Morgans Point**, about  $3\frac{1}{3}$  miles westward of Sugar Loaf Point, is conspicuous with its sand knolls and dark trees. Shoal water makes out southerly  $3\frac{1}{2}$  cables to a depth of 14 feet ( $4^m3$ ), with only 9 feet ( $2^m7$ ) a hundred yards ( $91^m4$ ) nearer shore.

35     Between Sugar Loaf and Morgans Point is a large open bay, with good holding ground in from 5 to 7 fathoms ( $9^m1$  to  $12^m8$ ), mud bottom. The shore of the bay is fringed with shoal water for an average distance of one-third of a mile.

40     **Grabell Point**, westward  $1\frac{3}{4}$  miles from Morgans Point, is low, rocky and not very conspicuous.

A reef, 6 cables wide, extends southward for a mile to a depth of 13 feet ( $4^m0$ ). To pass south of this reef, keep the Sugar Loaf open well south of Morgans Point, bearing  $068^\circ$ .

45     35     Vessels will not find very good anchorage in the bays on either side of Grabell Point, the bottom being rather hard.

To pass south of the shoals off Grabell Point and Morgans Point, keep Rockhouse Point (see page 125) in sight south of Lapp Point, (see below) bearing  $268^\circ$ .

40     **Rock Island** is a small, dry reef lying westward, 2 miles from Kinnard Point. Between Rock Island and the nearest point, lying half a mile north, the water is shallow, not more than 6 feet ( $1^m8$ ) deep. Shoal water makes out nearly half a mile southward, to a depth of 15 feet ( $4^m6$ ).

45     **Mohawk Point** is about 50 feet ( $15^m2$ ) high; tall trees make it appear higher. It is situated westward, 7 miles from Morgans Point. Shoal water makes off a quarter of a mile to a depth of 16 feet ( $4^m9$ ).

In thick weather or at night, do not shoal to less than 7 fathoms ( $12^m8$ ), if between Port Colborne and Mohawk Point.

Chart 2174.

**Moulton Bay.**—From the point just inside Rock Island, the shore trends first west and then southwest to Mohawk Point, forming Moulton Bay. The shore of the bay is fringed with shoal water from one-third to half a mile wide.

**Lowbanks** post office is situated at the head of Moulton Bay. 5

**Anchorage** in this bay is fairly good, the bottom being clay, covered in most places with boulders and gravel. Shelter from the west winds is good, but any wind south of that sends in a heavy sea.

**Caution.**—Masters of vessels finding themselves at any time well into the bays, on either side of Grabell Point or into Moulton Bay, should be very 10 careful about their course out, as several wrecks have been caused by masters turning to come out and not knowing the peculiar shape of the reefs, which keep their width to the outer end.

**Mohawk Bay** is a slight indentation west of Mohawk Point. The shore is fringed with a steep clay bank about 100 feet ( $30^{\text{m}}5$ ) high. The bay is about 15 3 miles wide at the mouth and about one mile long. Shoal water makes off far enough from the shore to spoil any shelter the bay might afford. Mohawk Island and its shoal fringe break the south and southeast seas a little. The holding ground is not good, being clay only in spots. The best anchorage is northwest of the light and distant 6 cables from it. Vessels drawing more than 20 8 feet ( $2^{\text{m}}4$ ) of water cannot pass inside Mohawk Island.

**Mohawk Island**, (*Lat.  $42^{\circ} 50' N.$  Long.  $79^{\circ} 31' W.$* ) 2.1 miles westward of Mohawk Point, is about 300 yards ( $274^{\text{m}}3$ ) in diameter and about 6 feet ( $1^{\text{m}}8$ ) high, with a lighthouse and a few bushes upon it. It lies  $1\frac{1}{8}$  miles offshore and three-eighths of a mile off the line joining Mohawk and Rockhouse Points. 25 Shoal water joins the island to the shore northeastward and also extends one cable to the westward. The worst reef makes out southeastward, 8 cables from the lighthouse to a depth of 10 feet ( $3^{\text{m}}0$ ), with only a few inches of water, a cable nearer the lighthouse tower. The reef is not marked in any way, and captains of vessels must judge their distance from the island. Bound for Port Maitland, a vessel should not haul in until the front range light is seen *well open* of the west side of Rockhouse Point, bearing  $315^{\circ}$ . 30

**Light.**—A light is exhibited, at a height of 70 feet ( $21^{\text{m}}3$ ), from a white, circular building with a dwelling attached, on Mohawk Island.

**Rockhouse Point** is the southeast entrance point to Connor Bay off Port 35 Maitland. It is situated westward,  $1\frac{1}{8}$  miles from Mohawk Island. The land at the point attains a height of about 40 feet ( $12^{\text{m}}2$ ). Shoal water makes off southwesterly 3 cables to 11 feet ( $3^{\text{m}}4$ ), and westerly, 6 cables to 15 feet ( $4^{\text{m}}6$ ).

**Grand River** empties into the head of **Connor Bay** lying between Rockhouse Point on the east and Grant Point on the west. It has a general uniform 40 width of 350 feet ( $106^{\text{m}}7$ ) for 5 miles up to Dunnville; there is a depth of 11 feet ( $3^{\text{m}}4$ ) up to within one-half mile of Dunnville and 8 feet ( $2^{\text{m}}4$ ) along the face of the wharf at that place.

**Dunnville Town** is situated about 3 miles behind the lake shore, or  $4\frac{1}{2}$  miles up the Grand River. 45

That part of Connor Bay on the west side of Port Maitland entrance is known as **Splatt Bay**.

## Chart 2174.

**Port Maitland**, situated at the outlet of the Grand River, is one of the most important harbours on the north shore of Lake Erie. The car ferry terminals and yards of the Toronto, Hamilton and Buffalo Railway are located 5 here.

**Piers and channels.**—Two piers, 292 feet (89<sup>m</sup>0) apart at the outer ends protect the entrance to the harbour. A channel, 300 feet (91<sup>m</sup>4) wide and 19 feet (5<sup>m</sup>8) deep, has been dredged from deep water in the lake to the entrance between the piers, its west edge being in line with the east side of the 10 west pier. Between the piers and shorewards for a distance of a mile, the depth is 18 feet (5<sup>m</sup>5). The turning basin opposite the car ferry slip has a width of 650 feet (198<sup>m</sup>1).

The wharf accommodation includes the car ferry slip and the slip of the 15 Toronto, Hamilton and Buffalo Railway on the east side of the harbour. The railway slip has a depth of 19 feet (5<sup>m</sup>8) and a width of 150 feet (45<sup>m</sup>7), with a berth of 1,000 feet (304<sup>m</sup>8) in length on the southeast side and on the northwest side another berth 767 feet (233<sup>m</sup>8) long. The coal storage capacity is 150,000 to 200,000 tons.

20 A retaining wall, 1,221 feet (372<sup>m</sup>2) long, extends northward from the inner end of the west pier along the western bank of the river. The outer 639 feet (194<sup>m</sup>8) has a reinforced concrete top.

**Caution.**—Considerable surge is caused by the car ferry in the entrance channel between the piers, and small craft securing there may have their lines parted and become damaged against the piers.

25 **Leading lights.—Fog signal.**—Leading lights are shown at Port Maitland. The front light is exhibited, at an elevation of 51 feet (15<sup>m</sup>5), from a white, square tower near the outer end of the west pier; the rear light is exhibited, at an elevation of 75 feet (22<sup>m</sup>9), from a square, skeleton tower, 900 feet (274<sup>m</sup>3), 023° from the front light.

30 A fog signal is sounded from the rear light-tower.

**Caution.**—When approaching Port Maitland from the westward, the front leading light should not be brought to bear anything to the eastward of 049°, to clear the shoal water off Grant Point.

35 In approaching from the eastward, the front leading light should not be brought to bear anything to the west of 320°, to clear the spit off Rockhouse Point.

40 **Current.**—With heavy southerly or southwesterly winds, the water is driven up the Grand River and held there. When the wind shifts sufficiently to the northwest the water rushes out causing a strong current that makes it difficult for a vessel to enter Port Maitland.

**Old Welland Canal feeder.**—At 700 yards (640<sup>m</sup>1) from the mouth of the Grand River, the feeder to the abandoned Welland Canal has an overflow outlet.

45 A channel, 800 feet (243<sup>m</sup>8) long and 10 feet (3<sup>m</sup>0) deep, has been dredged along the north side of the old canal feeder. For a distance of 565 feet (172<sup>m</sup>2) from the mouth, this channel is 50 feet (15<sup>m</sup>2) wide and for a further 235 feet (71<sup>m</sup>6) is 30 feet (9<sup>m</sup>1) wide.

## Chart 2174.

**Grant Point** is the southwestern entrance point of Connor Bay, into which Grand River empties. It is about 30 feet (9<sup>m</sup>1) high, with a sand beach on its west side, and a rocky shore to the eastward.

Shoal water makes off from Grant Point (*Lat. 42° 50' N. Long. 79° 38' W.*) 5 half a mile in all directions.

The shore between Port Maitland and Grant Point is comparatively clean, the shallow water extending off only 3 cables.

Two spots, with 13 and 16 feet (4<sup>m</sup>0 and 4<sup>m</sup>9) of water on them, bear 203° and 219°, respectively, distant 1 $\frac{1}{4}$  miles from Grant Point. 10

**Low Point** is unimportant in itself, but is the starting point of a string of shoals. It is situated northwesterly 1 $\frac{1}{4}$  miles from Grant Point and shoal water fringes the bay between for 3 $\frac{1}{2}$  cables, leaving a large area of good water between the banks off Grant and Low Points.

A long shallow bank, 9 cables wide, makes out southwest 2 $\frac{1}{4}$  miles to a 15 depth of 15 feet (4<sup>m</sup>6). On the same bearing, but 1 $\frac{1}{2}$  miles from Low Point, will be found a spot, with only 3 feet (0<sup>m</sup>9) of water on it, and inside this are many shoal spots.

**Tecumseh Reef** is really a continuation of the last-mentioned bank, but between them is a passage 2 cables wide, with a depth of 28 feet (8<sup>m</sup>5). The 20 shoalest spot on Tecumseh Reef, of 6 feet (1<sup>m</sup>8), bears 248° distant 4 $\frac{1}{4}$  miles from Grant Point. Another spot, with 9 feet (2<sup>m</sup>7) of water on it, lying 3 cables from the southwestern end of the reef bears 241°, distant 4 $\frac{3}{4}$  miles from the same point.

No very good mark offers for clearing Tecumseh Reef. The best, however, 25 is the top of the bank at Mohawk Point its own height open south of Mohawk Island light, bearing 073°.

In thick weather or at night, when near Tecumseh Reef, vessels should not shoal to less than 10 fathoms (18<sup>m</sup>3), nor to less than 7 fathoms (12<sup>m</sup>8) off Grant Point. 30

**Evans Point**, with its sandy knoll about 50 feet (15<sup>m</sup>2) high, is the highest point on this shore between Grand River and Peacock Point. It lies westward 5 $\frac{3}{4}$  miles from Grant Point. A spit makes off the point, south one mile, to a depth of 12 feet (3<sup>m</sup>7).

Between Grant and Evans Points, there is a bay 1 $\frac{1}{2}$  miles long, but it is 35 very foul.

There is a passage between Tecumseh Reef and Evans Point spit, 1 $\frac{3}{4}$  miles wide and 6 $\frac{1}{2}$  fathoms (11<sup>m</sup>9) deep.

## Chart 2175.

**Miller Point** lies westward, 4 $\frac{3}{4}$  miles from Evans Point.

Shoal water makes off southerly five-eighths of a mile, from Miller Point to a depth of 12 feet (3<sup>m</sup>7).

A spot, with 12 feet (3<sup>m</sup>7) of water on it, lies 180°, distant one mile from Miller Point.

Between Evans and Miller Points, the shore is fringed by shallow, foul 45 water for a distance of from three-quarters to 1 $\frac{1}{4}$  miles.

**Miller Bay** is the slight indentation just east of Miller Point. It is very foul, there being only 8 feet (2<sup>m</sup>4) of water at 9 cables offshore.

## Chart 2175.

**Hoover Point**, low and covered with tall, dark trees, lies westward  $2\frac{1}{2}$  miles from Miller Point.

Between Miller and Hoover Points is a small bay, with foul water 1,400 5 yards (1,280<sup>m</sup>2) offshore.

A rocky ledge makes out 9 cables in a southerly direction, off Hoover Point, where there is a depth of 13 feet (4<sup>m</sup>0), with less than 6 feet (1<sup>m</sup>8) a cable nearer shore.

A rocky bank, with 25 feet (7<sup>m</sup>6) least water on it, lies southwesterly 10 3<sup>3</sup>/<sub>4</sub> miles from Hoover Point and another bank, with the same least water on it lies south, 2<sup>1</sup>/<sub>4</sub> miles from the same point.

**Peacock Point** (*Lat. 42° 47' N. Long. 79° 59' W.*) lies westward 5 miles from Hoover Point, and 11<sup>1</sup>/<sub>4</sub> miles east of Port Dover front leading light. The point is about 50 feet (15<sup>m</sup>2) high and partially covered with tall, dark trees 15 that make it discernible from the offing. Between Hoover and Peacock Points is a bay, three-quarters of a mile long, but so foul as to be useless as an anchorage.

A shoal bank, with 13 feet (4<sup>m</sup>0) least water on it, lies with its eastern and shoalest part bearing 101°, 1<sup>1</sup>/<sub>4</sub> miles from the nearest part of Peacock 20 Point. The shoal, under 3 fathoms (5<sup>m</sup>5), is three-quarters of a mile long east and west by half that in width. Inside this bank, the water shoals rapidly and is dangerous, although, with great caution, a vessel may reach far in.

Another bank, with 11 feet (3<sup>m</sup>4) least water on it, has its shoalest part bearing 080°, 2 miles from the nearest part of Peacock Point. It is 4 cables 25 long east and west and one cable wide, the shoalest part being near the middle.

In thick weather or at night a vessel should not shoal to less than 10 fathoms (18<sup>m</sup>3), when offshore between Peacock and Evans Point. In this depth, a vessel will at times be close to shoal water and again about one-half to three-quarters of a mile off. A vessel, looking for an anchorage, will find 30 mud bottom with difficulty in less than 6 fathoms (11<sup>m</sup>0).

**Stony Creek** enters the lake 3<sup>1</sup>/<sub>4</sub> miles northeastward from the nearest part of Peacock Point and **Sandusk Creek** northeastward, 1<sup>1</sup>/<sub>2</sub> miles from the same place. The mouths of these two creeks make fair landing places for boats.

A small spot, with 14 feet (4<sup>m</sup>3) of water on it, lies 154°, 1<sup>1</sup>/<sub>4</sub> miles from 35 the highest part of Peacock Point.

A large bank extends off Peacock Point in a southwesterly direction 1<sup>1</sup>/<sub>4</sub> miles; southeasterly half a mile, and east 2 cables.

Outside the last-mentioned bank, a string of shoals stretches in a southwest direction, for 3 miles. The most dangerous is a large bank, with 7 feet 40 (2<sup>m</sup>1) least water, lying 226°, 2<sup>1</sup>/<sub>2</sub> miles from Peacock Point. This bank, under 3 fathoms (5<sup>m</sup>5), extends in a northwestward and southeastward direction, half a mile, with a width of two cables.

A spot, 2 cables in diameter, with 14 feet (4<sup>m</sup>3) least water on it lies 282°, three-quarters of a mile from the shoalest spot on the above bank.

45 Three spots, with 14, 8 and 13 feet (4<sup>m</sup>3, 2<sup>m</sup>4 and 4<sup>m</sup>0) of water on them, lie 237°, 230° and 220°, respectively, 1<sup>3</sup>/<sub>4</sub> miles from the highest part of Peacock Point.

**Coast.**—From Peacock Point, the shore trends northwesterly for 2<sup>1</sup>/<sub>2</sub> miles to the head of a bay and from there turns to a westerly direction for 9 miles 50 to Port Dover. The whole shore is lined with rocky reefs, stretching in places

## Chart 2175.

as much as one mile offshore. For a short distance on each side of the mouth of Nanticoke Creek, a vessel may approach within 4 cables of the shore, but the bottom is covered with boulders and great caution should be employed.

**Nanticoke Creek** is a small stream emptying into the lake at a point 5  $6\frac{3}{4}$  miles eastward from Port Dover. The mouth forms a small boat harbour, and is sheltered by two breakwaters.

The approach channel has been dredged to a depth of 10 feet (3 $m$ 0), and the inner harbour to a depth of 8 feet (2 $m$ 4).

**Leading lights.**—Leading lights are shown at the mouth of Nanticoke Creek. The front light (*Lat. 42° 48' N., Long. 80° 04' W.*) is exhibited, at an elevation of 30 feet (9 $m$ 1), from a white pole; the rear light is exhibited, at an elevation of 35 feet (10 $m$ 7), from a white pole, 290°, 100 feet (30 $m$ 5) from the front light. The lights are privately maintained.

**Nanticoke Shoal**, with 9 feet (2 $m$ 7) least water on it, the only detached 15 obstruction in Long Point Bay, is about 4 $\frac{1}{4}$  miles off Nanticoke, 5 $\frac{1}{2}$  miles southwestward from Peacock Point. The shoal is a small rocky ledge and, under a depth of 16 feet (4 $m$ 9), is 5 cables long in a northwest and southeast direction by 2 $\frac{1}{2}$  cables wide, the shoalest spot, 9 feet (2 $m$ 7), being near the middle.

**Port Dover** on the **Lynn River**, about 49 miles west of Port Colborne, is 20 a terminus of the Canadian National and Lake Erie and Northern Railways. The latter is electrically operated and is equipped for passenger and heavy freight traffic serving the cities and towns of Simcoe, Brantford, Paris, Preston, Galt, Kitchener, and Waterloo. It is the centre of the fishing industry on the north shore of Lake Erie. 25

The population in 1956 was 2,790.

The harbour is built at the mouth of the Lynn River, with piers extended from either side southwestward for protection. The piers are 100 feet (30 $m$ 5) apart at the outer ends, the western pier being 1,100 feet (335 $m$ 3) long, and overlapping the eastern by 125 feet (38 $m$ 1). The eastern pier is parallel to the 30 western for a short distance, and then diverges northeastward to form an enlarged basin, for the use of fishing craft and other small vessels. The Canadians National Railways has a siding and freight sheds on the western pier.

In 1955 the entrance between the piers at Port Dover was dredged to a depth of 10 feet (3 $m$ 0); along the west pier there is a depth of 10 $\frac{1}{2}$  feet (3 $m$ 3), 35 and over the greater part of the basin the depth is 5 $\frac{1}{2}$  to 8 feet (1 $m$ 6 to 2 $m$ 4). The ruins of the pier, extending about 300 feet (91 $m$ 4) outside the outer end of the west pier and lying immediately west of the west pier, are entirely submerged, and pile clusters have been driven to prevent vessels from fouling this obstruction. 40

**Light.**—A light (*Lat. 42° 47' N. Long. 80° 12' W.*) is exhibited, at an elevation of 20 feet (6 $m$ 1), from the outer end of the east pier.

**Buoy.**—A red spar buoy marks some boulders, about 75 feet (22 $m$ 9) out from and in line with the eastern pier at the entrance to the harbour.

**Marine railways.**—There are two marine railways at Port Dover, with 45 lifting capacities of 100 and 140 tons, respectively.

## Chart 2175.

**Leading lights.—Fog signal.**—Leading lights are shown at Port Dover. The front light is exhibited, at an elevation of 34 feet ( $10^{\text{m}}4$ ), from a white, square structure with a red lantern, near the outer end of the west pier; the rear light is exhibited, at an elevation of 45 feet ( $13^{\text{m}}7$ ), from a white, skeleton tower, 1,668 feet ( $508^{\text{m}}4$ ),  $022\frac{1}{2}^{\circ}$  from the front light.

5 A fog signal is sounded at the front light.

A reef makes out from Port Dover Harbour in a general southeast direction for  $1\frac{1}{4}$  miles. A spot, with  $11\frac{1}{2}$  feet ( $3^{\text{m}}6$ ) of water over it, lies  $163^{\circ}$ ,  $1\frac{1}{4}$  miles from the front leading light, and there are also several spots with six feet ( $1^{\text{m}}8$ ) or less over them, one mile east of and also inside of this spot.

**Buoy.**—A black spar buoy, moored in 15 feet ( $4^{\text{m}}6$ ) of water, marks the outer end of the dredged channel extending lakeward from the ferry slip.

**Coast.**—The land eastward of Port Dover, rising to a good height, 15 appears as a green slope, but is not conspicuous from seaward. To the westward of the port, the shore changes to bare sand cliffs, which are very conspicuous, as far west as Long Point Bay.

Southwestward  $3\frac{1}{2}$  miles along the shore from Port Dover, at the mouth of **Young Creek**, is the lakeside village of **Port Ryerse**.

20 **Normandale**, a very small fishing village, was once an important shipping point, and contained a smelter for iron ore. There is a small wharf and a few small houses to mark the place. The outer end of the wharf lies southwestward,  $7\frac{1}{2}$  miles from Port Dover front light.

25 The shore between Port Dover and Normandale is a high sand cliff surrounded by trees. It trends nearly straight, and is fringed with dangerous shoal water and boulders for an average distance of half a mile. A vessel should not shoal to less than 3 fathoms ( $5^{\text{m}}5$ ).

30 **Turkey Point** (*Lat.  $42^{\circ} 39' N.$  Long.  $80^{\circ} 21' W.$* ), the northeast entrance point to Inner Bay of Long Point Bay, is situated  $11\frac{1}{4}$  miles southwestward from Port Dover. It is very low and marked by a large club-house, the property of the Turkey Point Fish and Game Club. The point is surrounded on all sides by a large marsh, the southeast end of which is situated, one mile from Turkey Point. A road follows through the woods along the narrow strip of firm ground and is entered near Normandale.

35 **Wharf.**—Three miles north of the point is an L-shaped wharf, 500 feet ( $152^{\text{m}}4$ ) long; length of head 78 feet ( $23^{\text{m}}8$ ) with a depth of 4 feet ( $1^{\text{m}}2$ ) at the outer face.

Shoal water makes out from the marsh at Turkey Point to the eastward  $1\frac{1}{2}$  miles but, gradually narrowing until at Normandale, it is only half a mile wide.

40 **Potthawk Point**, the most northerly part of Long Point, lies  $4\frac{1}{4}$  miles southeastward from Turkey Point. About  $1\frac{3}{4}$  miles west of the extreme of the point, on the shore of a small indentation, are several club-houses.

**Shoal.**—A 2-fathom ( $3^{\text{m}}7$ ) shoal, the position of which is approximate, 45 was reported, in 1954, to lie about 6.6 miles,  $037^{\circ}$  from Potthawk Point.

**Inner Bay of Long Point Bay.—Channels.**—Between Turkey and Potthawk Points is situated the entrance,  $4\frac{1}{4}$  miles wide, to this shallow bay; 5 feet ( $1^{\text{m}}5$ ) is the deepest water that can be carried into the bay. Very shoal

## Chart 2175.

water makes out to 3 feet (0<sup>m</sup>9) from Pottohawk Point toward Turkey Point, 1 $\frac{1}{2}$  miles and off Turkey Point marsh south, 6 cables to 4 feet (1<sup>m</sup>2). Between these two spits are three channels and two very shallow banks of sand. These channels are usually buoyed.

Inner Bay is nearly elliptical, 8 miles long, east and west, and 5 $\frac{1}{2}$  miles wide. It has as much as 8 feet (2<sup>m</sup>4) of water in some places, but is principally very shallow. The southwest and Turkey Point shores are marshy; the northwest shore is a steep clay bluff, fringed with shallow water.

**Light-buoy.**—A black light-buoy, showing a *flashing white* light is 10 moored at the outer end of the northern channel leading to Inner Bay.

**Port Rowan**, (*Lat. 42° 37' N. Long. 80° 27' W.*) a small village situated on the west shore of Inner Bay, is the terminus of the South Norfolk branch of the Canadian National Railways. It is the headquarters for a considerable fishing industry and is a popular summer resort. This port is the main point of 15 supply for the large surrounding district of Long Point.

The population, in 1956, was 766.

**Wharf.**—There is a good wharf at the village extending southeasterly 1,075 feet (327<sup>m</sup>7) with a head 60 feet (18<sup>m</sup>3) in length. In 1957, there was a depth of 6 feet (1<sup>m</sup>8) (at elevation 570.00) at the face. In the berth on the southern side, there is a depth of 5 $\frac{1}{2}$  feet (1<sup>m</sup>6); 6 feet (1<sup>m</sup>8) will be found on the northern side. Near the inner end of the wharf is a boat basin, 600 feet (182<sup>m</sup>9) long and 50 feet (15<sup>m</sup>2) wide, with a depth of 6 feet (1<sup>m</sup>8) at the same datum. Sixty feet (18<sup>m</sup>3) off the head of the wharf, there is a depth of 5 feet (1<sup>m</sup>5).

**Leading lights.**—Leading lights, which in line bear 335°, lead to Port Rowan wharf.

**Buoys.**—The dredged channel is marked by a red conical buoy moored on the southeast side of the outer entrance, 750 feet (228<sup>m</sup>6) southeastward of the east corner of the wharf. The sides of the channel are marked by five black 30 and four red spar buoys.

**St. Williams**, a station on the Port Rowan branch of the Canadian National Railways, is a small village situated two-thirds of a mile inland from the west shore of Inner Bay, 3 $\frac{1}{2}$  miles from Port Rowan. The population is about 400. It is surrounded by a rich agricultural district.

**St. Williams wharf** is located 3 $\frac{1}{4}$  miles northeast of Port Rowan wharf. It is 449 feet (136<sup>m</sup>9) long, but there is only about 5 feet (1<sup>m</sup>5) of water at its outer end. This pier is used by fishermen and residents of St. Williams and the famous hunting preserve of Long Point, in connection with the transportation of supplies and fish.

**Light.**—A light is exhibited, at an elevation of 22 feet (6<sup>m</sup>7), from a steel tower on the outer end of St. Williams wharf.

(For Long Point, *see* next chapter.)

## CHAPTER X

### LAKE ERIE

#### LONG POINT TO POINT PELEE

Chart 2175.

5      **Long Point**, used as a game preserve the property of the Long Point Company, is 21 miles long from abreast Port Rowan and  $3\frac{1}{2}$  miles wide at its widest part, at Pottohawk Point, and contains an area of about 25 square miles. It is low and marshy, covered with tall trees, the marsh starting at the end of the clay bank mentioned above. There are, however, a few small sand  
10      knolls along the south shore from 20 to 60 feet ( $6^m1$  to  $18^m3$ ) high. About  $1\frac{1}{2}$  miles from the west end, the point is only a quarter of a mile wide and attempts have been made to keep a channel open from the lake to Inner Bay, to serve as a harbour of refuge. In 1817, when Admiral Bayfield surveyed this section, vessels drawing 9 feet ( $2^m7$ ) could find enough water close up to the west side  
15      15 of Inner Bay, but there was no gap. A gap was afterwards either artificially made or scoured out by the waves at this point and, in 1839, there was a good channel, half a mile wide with 11 feet ( $3^m4$ ) of water in it. This has completely filled up. In 1896, there was a small gap to the westward of this old channel with only a few inches of water through it. There have been some breaks  
20      20 through the point between this gap and Long Point light, but the company that owns the property attended to them in time and they soon closed.

**Big Creek**, at one time, emptied into the lake about  $2\frac{1}{2}$  miles west of the above-mentioned gap, but now flows into Inner Bay about one mile south of Port Rowan wharf.

25      **Port Royal** Village is on the lake shore highway about one mile up Big Creek and 2 miles southwest from Port Rowan. **Dedrich Creek** flows into Inner Bay half-way between Big Creek and Port Rowan.

From the above-mentioned gap, the south shore of Long Point trends for  
19 miles eastward to the end of the point. The beach, about 100 feet ( $30^m5$ ) wide, is composed of fine sand. Shoal water extends from 3 to 5 cables offshore  
30      for the whole length of the point, except at the east end, where deep water reaches to within  $1\frac{1}{2}$  cables of the point and just to the eastward of the gap where the shoal is slightly over a mile wide.

**Light.**—**Fog signal.**—**Radiobeacon.**—A light is exhibited, at an elevation of 97 feet ( $29^m6$ ), from a white, octagonal tower at the eastern end of Long Point.

A fog signal is sounded from a building close westward of the light-tower.

A radiobeacon is operated at the station.

**Wreck.**—The wreck of the *Pascal P. Pratt*, with 9 feet ( $2^m7$ ) of water over it, lies on the north side of Long Point, about  $2\frac{3}{4}$  miles,  $298^\circ$  from Long Point lighthouse; it is not buoyed.

**Bluff Point** (*Lat.  $42^\circ 34' N.$  Long.  $80^\circ 08' W.$* ) lies  $4\frac{1}{2}$  miles,  $290^\circ$  from the light. It is not very conspicuous but has a few small houses on it. The shore between Bluff Point and the light is low and sandy, and fringed with shoal  
45      water for a distance of half a mile.

## Chart 2175.

**Long Point** is a popular summer ground; there are cottages on its shores and about Inner Bay and a number of fish and game club-houses.

**Anchorage** may be found in depths of less than 10 fathoms (18<sup>m</sup>3) northward of Long Point. The 10-fathom (18<sup>m</sup>5) line skirts the point at 2 cables off and trends northwesterly 7 miles, then gradually turns to the eastward passing 4 miles south of Peacock Point. 5

**Bluff Bar.—Buoys.**—From Bluff Point, the very shoal water extends northwestward, 3 $\frac{1}{2}$  miles to the end of Bluff Bar. This sandbar has only a few inches of water on it, and, at the outer end, is half a mile from the shallow 10 water bordering the shore to the southward. Bluff Bar, therefore, forms a very good harbour half a mile wide and 1 $\frac{1}{2}$  miles long, with water ranging in depth from 18 to 23 feet (5<sup>m</sup>5 to 7<sup>m</sup>0). To enter this harbour, keep Long Point light just in sight past the trees on Bluff Point, bearing 105°. The north side of Bluff Bar is northwest 2 $\frac{1}{4}$  miles from Bluff Point. To pass north of the shoal 15 water, keep Port Rowan, when visible, in sight north of Pottahawk Point, bearing 270°. A black spar buoy is moored in 22 feet (6<sup>m</sup>7) of water close off the west end of the bar, and a black spar buoy, fitted with a reflector band, is moored on the northern side of the bar.

**Clear Creek** is a small creek and fishing village 7 $\frac{1}{2}$  miles west of the west 20 end of Long Point. Between Clear Creek and the gap through Long Point the shoal water extends offshore from 3 to 6 cables.

The village is a quarter of a mile back from the shore and on the highway 9 miles west from Port Rowan.

A clay bank, starting 2 $\frac{1}{2}$  miles eastward of Clear Creek, extends along the 25 shore, with slight breaks where streams enter the lake, as far as Morpeth Pier.

**Houghton Sand Hills** are two very conspicuous marks on the shore; the eastern and higher, over 190 feet (57<sup>m</sup>9) high, is situated 9 $\frac{1}{4}$  miles eastward from Port Burwell main light, and 30 $\frac{1}{2}$  miles from Long Point light. The western hill is situated one mile from the eastern. They are both large piles of sand 30 from 70 to 90 feet (21<sup>m</sup>3 to 27<sup>m</sup>4) higher than the regular bank, oval-shaped, about 800 feet (243<sup>m</sup>8) long, parallel to the shore and 400 feet (121<sup>m</sup>9) wide.

## Chart 2100.

The shore between Port Burwell and Houghton Sand Hills is nearly straight. The clay banks that fringe the shore give place in the neighbourhood 35 of these hills, to steep sand cliffs, about 125 to 140 feet (38<sup>m</sup>1 to 42<sup>m</sup>7) high, appearing from a distance unbroken, like the clay banks, but in reality very much indented. The cliffs, too, are further removed from the water edge and leave a sand beach from 100 to 400 feet (30<sup>m</sup>5 to 121<sup>m</sup>9) wide. The shore is fringed with water less than 3 fathoms (5<sup>m</sup>5) deep, for a width of 700 yards 40 (640<sup>m</sup>1), and a depth of 5 fathoms (9<sup>m</sup>1) will be found at 1,400 yards (1,280<sup>m</sup>2) offshore.

There are no stones nor hard bottom off the whole shore from Long Point to Port Burwell.

**Little Otter Creek** enters the lake three-quarters of a mile east of Port 45 Burwell Harbour.

## Chart 1281.

**Port Burwell**, situated at the mouth of **Big Otter Creek**, 40 miles westward of Long Point light, is, with the exception of Port Colborne, the best harbour on the north shore of Lake Erie. It is a terminus of a branch of the 5 Canadian Pacific Railway and a car ferry operates between this place and Ashtabula, Ohio.

The population is about 722. Fishing is the main industry.

**Harbour.**—The harbour is formed by two lines of works running almost north and south; the east line is 3,413 feet (1,040<sup>m</sup>3) in length and the west 10 line 2,855 feet (870<sup>m</sup>2), both extending into Lake Erie a distance of about 1,200 feet (365<sup>m</sup>8), the balance being along the banks of the creek. The width of the entrance between the piers is 155 feet (47<sup>m</sup>2), narrowing to 125 feet (38<sup>m</sup>1) at a point 500 feet (152<sup>m</sup>4) farther in, thence the space widens irregularly as the river is entered; the turning basin for the car ferry is 350 feet (106<sup>m</sup>7) in 15 width at its widest part, just inside the rear leading light.

**Breakwaters.**—From a point 275 feet (83<sup>m</sup>8) west-southwestward of the outer end of the west pier, a breakwater extends 1,200 feet (365<sup>m</sup>8) southerly and 1,800 feet (548<sup>m</sup>6) southwesterly; at about the middle of the first section there is a checkwater 200 feet (61<sup>m</sup>0) long.

20 **Depths.**—The following conditions existed in Port Burwell Harbour in the spring of 1956:

A depth of 18½ feet (5<sup>m</sup>7) can be carried from the entrance piers up to the car ferry dock. In the turning basin, there is a least depth of 14 feet (4<sup>m</sup>3). In the approach to the harbour, there is a depth of 18½ feet (5<sup>m</sup>7). Alongside 25 the wharf on the west side of the harbour, abreast the car ferry dock, is a depth of 11½ feet (3<sup>m</sup>6) with deep water immediately outside. Silting is rapid and the depths cannot be relied upon.

30 **Lights.**—**Fog signal.**—**Leading lights.**—A light (*Lat. 42° 39' N., Long. 80° 48' W.*) is exhibited, at an elevation of 90 feet (27<sup>m</sup>4), from a white, octagonal tower on the eastern side of the harbour.

A light is exhibited, at an elevation of 42 feet (12<sup>m</sup>8), from a lantern on a pole on the outer end of the west breakwater extension.

A light is exhibited, at an elevation of 30 feet (9<sup>m</sup>1), from a red, pyramidal frame, on the outer end of the west breakwater.

35 A light is exhibited, at an elevation of 56 feet (17<sup>m</sup>1), from a skeleton, steel tower, at the inner end of the west breakwater, 342°, 1,175 feet (358<sup>m</sup>1) from the outer light. The above two lights serve as leading lights for the outer approach channel.

A fog signal is sounded at the above light.

40 Leading lights are shown at Port Burwell. The front light is exhibited, at an elevation of 24 feet (7<sup>m</sup>3), from a latticed, steel pole, on the outer end of the east pier; the rear light is exhibited, at an elevation of 36 feet (11<sup>m</sup>0), from a similar structure, 1,300 feet (396<sup>m</sup>2), 355° from the front light.

Vessels entering the harbour should remain on the leading line, when 45 approaching the harbour.

Should the electric fog signal be out of commission, a bell, rung by hand, situated on the east pierhead, will be used to answer vessels' signals.

**Radio station.**—A radio mast, 185 feet (56<sup>m</sup>4) high, is located about a third of a mile east of the main light. (*See page xx.*)

## Chart 2181.

The town is located on the east side of the harbour and is rather conspicuous, rising gradually, as it does, from the lake, in marked contrast to the clay banks in the immediate neighbourhood.

There is a hospital at Tilsonburg, distant 18 miles by highway. 5

**Ice.**—During the winters of 1931-2 and 1932-3, the harbour was not icebound.

## Chart 2100.

**Silver Creek** is the largest of a number that flow into the lake, between Port Burwell and Port Bruce, and lies  $7\frac{1}{4}$  miles west of the former port. 10

**Port Bruce** (*Lat.  $42^{\circ} 40' N.$  Long.  $81^{\circ} 01' W.$* ) is a small harbour at the mouth of **Catfish Creek**,  $10\frac{1}{2}$  miles west of Port Burwell. It does not show up very prominently, as there are only a few small houses and a large warehouse. The clay bank, however, disappears, the valley of the Catfish making a gap about a quarter of a mile wide in it. 15

This place is an important fishing centre in a prosperous farming district. The water is too shallow to use the port as a harbour of refuge, except for small boats. However, it is the only harbour available, even for small boats, on a difficult shoreline between Port Burwell and Port Stanley, a distance of about 20 miles. 20

The harbour is formed by two piers running almost north and south, the west pier being 964 feet (293<sup>m</sup>8) long and the east pier being 560 feet (170<sup>m</sup>7) long. In 1951, the east pier was mostly submerged. Between here and Port Burwell, the shore makes a slight bay 1,300 yards (1,188<sup>m</sup>7) long, fringed with a clay bank 100 feet (30<sup>m</sup>5) high, with only small stretches of beach for landing. 25

**Light.**—A light is exhibited, at an elevation of 22 feet (6<sup>m</sup>7), from a lamp standard on the outer end of the west pier at Port Bruce.

**Coast.**—The whole shore from Port Burwell to Port Bruce is fringed with shoal water, less than 3 fathoms (5<sup>m</sup>5) for a width of 400 yards (365<sup>m</sup>8), and a depth of 5 fathoms (9<sup>m</sup>1) will be found off the shore at an average distance of 1,200 yards (1,097<sup>m</sup>3). The bottom is all mud, clay or sand overlying the clay. 30

From Port Bruce, the coast trends nearly straight west  $10\frac{1}{2}$  miles to Port Stanley. The high clay banks, about 120 feet (36<sup>m</sup>6), still fringe the shore and leave practically no beach for landing. 35

## Chart 2181.

**Port Stanley** is an important harbour of refuge at the mouth of **Kettle Creek**,  $8\frac{1}{2}$  miles south of the City of **St. Thomas**, 60 miles westward of Long Point light. It is easily recognized by the many cottages lining the shore and a large summer hotel, situated on the high bluff immediately east of the harbour. The clay banks end abruptly just before reaching the entrance, but rise again on the west side to about the same height. 40

The lift bridge crossing Kettle Creek is open for the passage of small boats, daily, at 9 a.m., 2 p.m., 5 p.m., and 9 p.m.

Port Stanley is a terminus of the Canadian National Railways and the London and Port Stanley electric railway. 45

## Chart 2181.

Freight boats of various companies run to Port Stanley from Great Lakes ports.

This port is the most important fishing point in western Ontario.

5 The population, in 1956, was 1,480.

**Piers.**—The inner harbour entrance is between a sheet pile wall on the east and a pier on the west side, 175 feet (53<sup>m</sup>3) apart, extending southwards into the lake and northwards into an enlarged basin, with a maximum width of 350 feet (106<sup>m</sup>7), used for the turning of the smaller lake boats. The sheet pile wall forming the eastern side of the entrance is 795 feet (242<sup>m</sup>4) long. Adjoining it at its northern end, and forming an extension to this wall, is east pier, 180 feet (54<sup>m</sup>9) in length. Beyond east pier, there is the sheet pile wall which is the east side of the turning basin, extending in an irregular direction, mostly northerly, to a point opposite the inner end of the west pier at the 10 mouth of Kettle Creek. The pier on the west side is 2,110 feet (643<sup>m</sup>1) long and overlaps the sheet pile wall on the opposite side of the entrance by about 400 feet (121<sup>m</sup>9).

**Warehouse.**—On the west pier, near its northern end, is a warehouse 220 feet (67<sup>m</sup>1) long and 40 feet (12<sup>m</sup>2) wide. It is of reinforced concrete construction, with concrete floors.

20 **Slip.**—To the west of the outer end of the western pier is the Railway slip, about 120 feet (36<sup>m</sup>6) in average width, enclosed on its western side by a pier about 400 feet (121<sup>m</sup>9) long, extending in an irregular line from about the shore line to a point about 140 feet (42<sup>m</sup>7) beyond the end of the western pier.

25 In 1957, the wreck of a dredge obstructed the slip. The southern end of the obstruction is marked by a red spar buoy.

**Breakwaters.**—The western breakwater, beginning at the shore 250 feet (76<sup>m</sup>2) west of the railway pier, extends south 630 feet (192<sup>m</sup>0) and then southeastward, 800 feet (243<sup>m</sup>8) to its outer end, which is about on the prolongation of the western pier and 1,300 feet (396<sup>m</sup>2) from the outer end of that pier. From the angle in the breakwater, a checkwater arm extends north-easterly, 200 feet (61<sup>m</sup>0) toward the railway pier and another checkwater arm on the west side of the angle in the breakwater runs west for 50 feet (15<sup>m</sup>2).

30 The eastern breakwater lies, with its outer end northeastward, 425 feet (129<sup>m</sup>5) from the outer end of the western breakwater, forming the breakwater entrance, from which it extends 1,200 feet (365<sup>m</sup>8) to the northeast, then northerly 700 feet (13<sup>m</sup>4), then northwestward for 1,000 feet (304<sup>m</sup>8).

35 **Depths.**—At the entrance to Port Stanley, there is a channel 100 feet (30<sup>m</sup>5) wide, with a depth of 19 feet (5<sup>m</sup>8), parallel to and 200 feet (61<sup>m</sup>0) eastward of the alignment of the leading lights; it is marked by two red spar buoys on the eastern side and by two black spar buoys on the western side.

40 Continuing into the harbour, a depth of 17<sup>3</sup>/<sub>4</sub> feet (5<sup>m</sup>5) can be carried to abreast the northern end of the west pier.

45 **Lights.**—**Leading lights.**—**Fog signal.**—A light is exhibited, at an elevation of 16 feet (4<sup>m</sup>9), from a steel tower on the outer end of the east breakwater.

A light is exhibited, at an elevation of 20 feet (6<sup>m</sup>1), from a lantern on a pole, near the outer end of the west pier.

50 Leading lights are shown at Port Stanley. The front light is exhibited, at an elevation of 29 feet (8<sup>m</sup>8), from a latticed, steel pole on the outer end of the west breakwater; the rear light is exhibited, at an elevation of 50 feet

## Chart 2100.

(15<sup>m</sup>2), from a mast, with a white, triangular daymark, about 1,600 feet (487<sup>m</sup>7), 344° from the front light.

A fog signal is sounded at the front light.

From Port Stanley, the shore trends nearly straight southwesterly 38 miles to Morpeth Pier. Between these two places, the clay bank along the shore is nearly level having a height of 120 feet (36<sup>m</sup>6) at Port Stanley. The shore is a narrow shingle beach, with no shelter, even for boats, in a sea. The water gradually deepens, there being a fringe 500 yards (457<sup>m</sup>2) wide, with less than 3 fathoms (5<sup>m</sup>5), and 1,500 yards (1371<sup>m</sup>6), with less than 5 fathoms (9<sup>m</sup>1). 10 Small creeks empty into the lake at the following small settlements: at **Port Talbot**, 7½ miles from Port Stanley; at **Tyreconnel**, 13½ miles from the same place; at **New Glasgow**, 14½ miles from Morpeth Pier; and at **Clearville**, 8 miles from the same place. In none of these creeks, however, can even a small boat find shelter. 15

There are few conspicuous objects along the shore, but large, old warehouses with dilapidated wharves mark Port Talbot (at the mouth of Talbot Creek), Tyreconnel, New Glasgow, and Clearville. 15

**Anchorage.**—The anchorage is generally good in clay, which is, however, often covered with small boulders. 20

**Plum Point**, situated southwestward, 10 miles from the light on the breakwater at Port Stanley, may be easily recognized by its high clay bank being of a lighter colour and surmounted by a green slope.

**Patrick Point** is situated 14 miles from the light on the breakwater at Port Stanley. It may be recognized by the bare clay bank there suddenly lowering and giving place to tall, dark trees. The small settlement, Tyreconnel, lies just north of the point. 25

Off both Plum and Patrick Points are many boulders, but none very shoal.

**Morpeth Pier.**—Northward 7½ miles from the extreme of Pointe Aux Pins 30 is situated a small pier, 263 feet (80<sup>m</sup>2) in length. The pierhead is 30 feet (9<sup>m</sup>1) square, with a depth of 3½ feet (1<sup>m</sup>0) alongside. Beyond the end of the pier lies submerged cribbing, 70 feet (21<sup>m</sup>3) in length. This wharf was not in good repair in 1945.

**Morpeth Village** lies two miles northward of the pier. 35

The shore between Pointe aux Pins and Morpeth Pier is nearly straight, but leaves a small bay in which vessels will find good anchorage, in from 3 to 7 fathoms (5<sup>m</sup>5 to 12<sup>m</sup>8), mud and boulders, with fair shelter from north to southwest winds through west.

**Pointe aux Pins** (*Lat. 42° 16' N. Long. 81° 51' W.*) is situated southwesterly 43 miles from Port Stanley. This is a very low, sandy point; the trees, however, give it the appearance of being about 150 feet (45<sup>m</sup>7) high. The water off this portion of the shore is good, but vessels should not shoal to less than 5 fathoms (9<sup>m</sup>1).

This point, forming the east side of Rondeau Harbour, is about 5 miles 45 long north and south, 2½ miles wide at the southern end, narrowing to a quarter of a mile at the northern, inner end of the harbour.

It is a bird sanctuary and game preserve.

*Chart 2181.*

**Light.**—A light is exhibited, at an elevation of 40 feet (12<sup>m</sup>2), from a wooden, skeleton tower on the southern extremity of Pointe aux Pins.

**Rondeau Harbour.**—From Pointe aux Pins light, the coast trends west-  
5 erly 3 miles to Rondeau Harbour. The low west side of the entrance is well marked by summer cottages, hotels, and buildings of an amusement park. The east side of the entrance is a long narrow sand spit with a few trees upon it, and the lightkeeper's dwelling.

**Rondeau** is a terminus of the Sarnia and Rondeau branch of the Chesa-  
10 peake and Ohio Railway. The station and post office are called **Erieau**. It is a popular summer resort, and is one of the best natural harbours on the north shore of Lake Erie; an important harbour of refuge and port of entry.

The Lake Erie Coal Company operates a car ferry and a collier between this port and Conneaut, Ohio.

15 A large modern coal-handling plant and storage yards are maintained.

The population was 475 in 1956.

**Piers.**—The entrance to the harbour is between two piers, 250 feet (76<sup>m</sup>2) apart. The western pier is 2,080 feet (634<sup>m</sup>0) long, projecting 1,200 feet (365<sup>m</sup>8) outside the shoreline. The eastern pier is 783 feet (238<sup>m</sup>7) long.

20 Extending westerly, at right angles, from the inner end of the western pier is the Lake Erie Coal Company wharf, 1,800 feet (548<sup>m</sup>6) long. The dredged slip alongside is about 80 feet (24<sup>m</sup>4) wide. Other craft may use this slip when they do not interfere with the ferry. At the outer end of the slip, on the north side, is a car ferry landing extending almost in prolongation of the north shore  
25 of the slip.

**Channels.**—The channel between the entrance piers has a least depth of 20 feet (6<sup>m</sup>1) over a width of 200 feet (61<sup>m</sup>0). Abreast the breakwater the channel is 250 feet (76<sup>m</sup>2) wide with a minimum depth of 19<sup>3</sup>/<sub>4</sub> feet (6<sup>m</sup>0).

The Lake Erie Coal Company slip has been dredged for 1,800 feet (548<sup>m</sup>6) 30 to a width of 60 feet (18<sup>m</sup>3). This slip is maintained at a least depth of 18 feet (5<sup>m</sup>5).

**Current.**—With southeast winds the water rises considerably in the harbour and lowers rapidly upon a change to southwest, causing such a strong current as to make it unsafe to be in the channel.

35 **Light.—Leading lights.—Fog signal.**—A light is exhibited, at an elevation of 36 feet (11<sup>m</sup>0), from a red, square, skeleton tower on the outer end of the east pier.

Leading lights are shown at Rondeau. The front light is exhibited, at an elevation of 25 feet (7<sup>m</sup>6), from a pyramidal structure on the outer end of the  
40 west pier. Four feet (1<sup>m</sup>2) above this light is another light visible from all points seaward. The rear light is exhibited, at an elevation of 56 feet (17<sup>m</sup>1), from a white, square, skeleton tower, 1,350 feet (411<sup>m</sup>5), 012° from the front light.

A fog signal is sounded from the outer end of the west breakwater.

## Chart 2100.

**Rondeau Bay** is about  $5\frac{1}{2}$  miles long by 2 miles in greatest width. It is very shallow; there being only one fathom ( $1^m8$ ) or less water, with the exception of the dredged portion forming Rondeau Harbour. The shores are marshy with many creeks.

5

**Rondeau National Park.**—This is a primeval forest of about 8 square miles in area, surrounding the northern part of the bay. Wildlife flourishes in the preserve.

**Coast.**—From Rondeau Harbour, the shore trends westward for about 5 miles and then gradually curves around to southwestward for about 20 miles and then curves again to south for 13 miles to Pelee Point. The shoal bank along this section of coast is close inshore, and the land is from 30 to 80 feet ( $9^m1$  to  $24^m4$ ) high, the highest part being near the middle of the stretch.

10

About  $10\frac{1}{4}$  miles northward of Pelee Point is the small fishing harbour of **Wheatley** (*Lat.  $43^{\circ} 03'$  N. Long.  $82^{\circ} 28'$  W.*).

15

Two breakwaters, 75 feet ( $22^m9$ ) apart, protect the entrance to a dredged slip 1,600 feet ( $487^m7$ ) long, with a channel 60 feet ( $18^m3$ ) wide and 6 feet ( $1^m8$ ) deep.

There are wharfs to the eastward and westward of the breakwaters.

**Leading lights.—Fog signal.**—Leading lights are shown at Wheatley.  $20$  The front light is exhibited, at an elevation of 25 feet ( $7^m6$ ), from a mast on the outer end of Wheatley wharf; the rear light is exhibited, at an elevation of 32 feet ( $9^m8$ ), from a mast 723 feet ( $220^m0$ ), 006° from the front light.

A fog signal is sounded at the outer end of Wheatley wharf.

**Wheatley Village** lies about  $1\frac{1}{4}$  miles inland, northward, from the pier. It  $25$  is a station on the Chesapeake and Ohio Railway and a summer resort. In 1956, the population was 1,196. The main industry is fishing.

Five miles west from Rondeau, and one mile back from the lake, is the village of **Cedar Springs**, with no landing. From here, a highway (Talbot Road) follows close to the shore to Wheatley. Small villages, or summer resorts, are scattered along the lake shore, **Ouvry** about 7 miles from Rondeau, **Port Alma**,  $8\frac{1}{2}$  miles farther on, and **Romney**, which is  $6\frac{1}{2}$  miles east of Wheatley pier.

30

**Caution.**—A gas well drilling site, extending  $2\frac{1}{2}$  miles offshore from Port Alma, is marked by ten spar buoys, spaced at one mile intervals around the  $35$  perimeter.

## CHAPTER XI

### LAKE ERIE

#### POINT PELEE TO DETROIT RIVER

Charts 2182, 2183.

5 **Pelee Point** is the southernmost point on the north shore of Lake Erie, and is situated  $41\frac{1}{2}$  miles southwestward of Pointe aux Pins lighthouse. The point is the extremity of a peninsula projecting about 10 miles southward into Lake Erie, narrowing uniformly and terminating in a sharp point. Excellent anchorage is to be found to leeward of the peninsula. There are no landing piers or  
10 docks on the point. Deep water approaches to within three-eighths of a mile on both sides of the peninsula, but a very shallow sand and gravel spit extends for about one mile southward of the point.

A dangerous shoal area extends about 6 miles south-southeastward of Pelee Point, and includes **East Shoal**, with a least depth of 11 feet ( $3^m4$ ) over it,  
15 **Southeast Shoal**, with a least depth of 13 feet ( $4^m0$ ) over it, and several other detached shoals.

**Light-and-bell-buoy.**—A light-and-bell-buoy, showing a *flashing red* light, is moored  $2\frac{3}{4}$  miles southward of Pelee Point, and 1,000 feet ( $304^m8$ ) south-southwestward of a submerged crib, with a depth of 6 feet ( $1^m8$ ) over it.

20 **Light.**—**Fog signal.**—**Radiobeacon.**—A light is exhibited, at an elevation of 58 feet ( $17^m7$ ), from a white, concrete building with three black stripes, situated close to the southern extremity of Southeast Shoal.

A fog signal is sounded at the light.

A radiobeacon is situated at the light-structure.

25 **Wreck.**—The wreck of the wooden steamer *Jay Gould*, sunk in June 1918, with a least depth of 17 feet ( $5^m2$ ) over it, lies about  $3\frac{1}{2}$  miles,  $050^\circ$ , from Southeast Shoal light-structure. This position is well to the northward of the track from Pelee Passage eastward.

30 **Pelee Point** post office, open in the summer, lies on the western side of the peninsula,  $3\frac{1}{2}$  miles northward of Pelee Point. The greater part of the peninsula is marshy, with low sandy ridges along both shores.

**Pelee Passage**, situated between Pelee Point and Pelee Island, is the main channel through the island region and affords ample water for ships bound from Detroit River to points eastward and southward.

35 **Light.**—**Fog signal.**—A light is exhibited at an elevation of 75 feet ( $22^m9$ ), from a white, circular tower surmounted by a red lantern, on a pier, near the northern end of Middle Ground Shoal. It is known as Pelee Passage light.

A fog signal is sounded at the light.

40 **Wrecks.**—The wreck of the steamer *Specular*, with 17 feet ( $5^m2$ ) of water over it, lies  $3\frac{1}{8}$  miles,  $129^\circ$ , from Pelee Passage light.

## Charts 2182, 2183.

The wreck of the barge *Tasmania*, with 23 feet (7<sup>m</sup>0) of water over it, lies 3 $\frac{1}{2}$  miles, 212°, from Southeast Shoal light.

**Middle Ground Shoal** is a rocky reef lying with its shoalest spot of 8 feet (2<sup>m</sup>4), about three-quarters of a mile, 159°, from Pelee Passage light. From this shoal spot, water, with depths of under 18 feet (5<sup>m</sup>5), extends a mile northward and westward, respectively. 5

Several detached shoal patches, with depths of less than 18 feet (5<sup>m</sup>5) over them, the positions of which can best be seen on the chart, lie westward and southward of Middleground Shoal. 10

**Buoys.**—A light-and-bell-buoy, marked with black and white vertical stripes, and showing a *flashing white* light, is moored 4,600 feet (1,402<sup>m</sup>1), 025°, from Pelee Passage light. It is fitted with a radar reflector.

A black spar buoy, fitted with a radar reflector, is moored 1,800 feet (548<sup>m</sup>6), 031°, from the above light. 15

A light-buoy, painted with red and black horizontal bands and fitted with a radar reflector, is moored close eastward of a 26-foot (7<sup>m</sup>9) shoal, 1.9 miles eastward of Pelee Passage light.

**Grubb Reef**, on the northerly side of Pelee Passage, northeastward of Middle Ground Shoal, comprises several detached rocky patches, the shoalest of which, with 12 feet (3<sup>m</sup>7) of water over it, lies 2 $\frac{7}{8}$  miles, 028°, from Pelee Passage lighthouse (*Lat. 41° 25' N. Long. 82° 33' W.*). Shoal water extends 1,500 feet (457<sup>m</sup>2) north and 3,000 feet (914<sup>m</sup>4) south of the shoalest spot, and a detached 17-foot (5<sup>m</sup>2) shoal lies one mile southeastward of it. 20

**Light-buoy.**—A red light-buoy, showing a *flashing red* light, is moored close southeastward of an 18-foot (5<sup>m</sup>5) patch, and 1.5 miles, 055°, from Pelee Passage light. 25

**Pelee Island**, the largest island in Lake Erie, lies with its northern point (Lighthouse Point) about 8 $\frac{1}{2}$  miles southwestward of Pelee Point. Its extreme length, north and south, is about 8 miles, and its greatest width, near the southern end, is about 3 $\frac{1}{2}$  miles. The island is very fertile and fruits and farm produce are exported. A ferry operates between the island and the Canadian mainland. The island is a part of Essex County. The population, in 1951, was 516. 30

## Chart 2183. United States charts 364, 36.

**Lighthouse Point**, the most northerly point of the island, is the north end of the east shore. There is a lighthouse tower on this point, but the light was discontinued in 1909. 35

From Lighthouse Point, a rock shoal, under a depth of 3 fathoms (5<sup>m</sup>5), extends northeasterly one mile. The area between this point and Middle Ground Shoal is fouled by spots, with from 16 to 19 feet (4<sup>m</sup>9 to 5<sup>m</sup>8) of water 40 on them.

**North Bay.**—From Lighthouse Point, the coast of Pelee Island trends southwesterly for 1 $\frac{1}{2}$  miles and then gradually curves around northwesterly to Sheridan Point, 2 $\frac{1}{2}$  miles from Lighthouse Point, forming North Bay, a wide shallow bight. From the head of the bay, shoal water under 3 fathoms (5<sup>m</sup>5) 45 makes off three-quarters of a mile.

## Chart 2183. United States charts 364, 36.

**North Wharf** or **Scudder dock**, with 15 feet (4<sup>m</sup>6) of water at the outer end, is located in the southeasterly side of North Bay 1<sup>3</sup>/<sub>4</sub> miles from Lighthouse Point. The dock is 830 feet (252<sup>m</sup>9) long, with the shore section 513 feet 5 (156<sup>m</sup>4) long and 22 feet (6<sup>m</sup>7) wide extending northwest and the outer section 322 feet (98<sup>m</sup>1) long and 45 feet (13<sup>m</sup>7) wide running north. A channel of approach to the wharf has been dredged to 14 feet (4<sup>m</sup>3), but the controlling depth of water is about 11 feet (3<sup>m</sup>4), because of storm and low water conditions which arise occasionally. A berth on the east side of the wharf, for a 10 distance of 250 feet (76<sup>m</sup>2), had a least depth of 12 feet (3<sup>m</sup>7) in 1956. There is a warehouse on the wharf, near the bend, and a grain elevator at the outer end. For the protection of small boats, a crib projects from the eastern side of the pier, about 400 feet (121<sup>m</sup>9) from shore. About 400 feet (121<sup>m</sup>9) to the eastward of and parallel to the North wharf, a breakwater extends 500 feet 15 (152<sup>m</sup>4) in a northwesterly direction, thence in a westerly direction for 195 feet (59<sup>m</sup>4), forming a protected harbour, dredged, in 1954, to a depth of 5 feet (1<sup>m</sup>5).

**Lights.**—A light is exhibited, at an elevation of 18 feet (5<sup>m</sup>5), from a lantern on the elevator at the outer end of North Wharf.

20 A light is exhibited, at an elevation of 28 feet (8<sup>m</sup>5), from a steel tower, situated on the outer end of the crib projecting eastward from North Wharf.

**Warning.—Cables.**—A telephone cable between Pelee Island and the mainland runs in a direct line from North Wharf to Leamington. A submarine power cable, runs from a position 3 cables northward of Pelee Point, to a position 25 9 cables southwestward of Lighthouse Point, Pelee Island. Masters of vessels are cautioned not to anchor in the vicinity of these cables. There is a post office near the wharf.

**Sheridan Point** (*Lat. 41° 49' N. Long. 82° 41' W.*), at the northwest corner of Pelee Island, has shoal water, under 3 fathoms (5<sup>m</sup>5), making out 30 three-eighths of a mile north, and half a mile northeasterly, from the most easterly part of the point. A quarter of a mile north of the same point, 9<sup>1</sup>/<sub>2</sub> feet (2<sup>m</sup>9) of water will be found.

From a point a quarter of a mile south of Sheridan Point, the west coast runs practically straight southward for three miles and then gradually curves 35 southeasterly for a further 2<sup>1</sup>/<sub>4</sub> miles to **Mosquito Point**. Along the section of the coast from Sheridan Point to West Dock, shoal water, under 3 fathoms (5<sup>m</sup>5), extends out from a quarter to half a mile.

A bank, with depths of from 16 to 21 feet (4<sup>m</sup>9 to 6<sup>m</sup>4) on it, makes out 40 westerly 3<sup>1</sup>/<sub>4</sub> miles from the shore, just south of West Dock, toward the Chicken Islands..

**West Dock** and **Pelee Island post office**, are located on the west shore, 3<sup>1</sup>/<sub>2</sub> miles from Sheridan Point. The dock is 597 feet (182<sup>m</sup>0) long and extends nearly due west to a depth of 14 feet (4<sup>m</sup>3). The inner section of 333 feet (101<sup>m</sup>5) is 26<sup>1</sup>/<sub>2</sub> feet (8<sup>m</sup>0) wide and the outer section of 264 feet (80<sup>m</sup>5) is 45 40 feet (12<sup>m</sup>2) wide.

There is a warehouse on the pier and a Custom House at the head of the dock.

Another dock, for the use of the stone quarry, is situated 2,200 feet (670<sup>m</sup>6) north of West Dock.

## Chart 2183. United States charts 364, 36.

**Light.—Fog signal.**—A light is exhibited, at an elevation of 30 feet (9<sup>m</sup>1), from a red, steel tower with oval-shaped daymark, on the outer end of West Dock.

A hand fog-horn answers signals from vessels approaching the wharf. 5

**Mosquito Bay** is a slight indentation in the coast just south of Mosquito Point. At this point, shoal water, under 3 fathoms (5<sup>m</sup>5), makes off westerly about half a mile.

**Fish Point**, the southerly extremity of Pelee Island, is a narrow point, extending about one mile from the main body of the island. A sand spit, with less than one fathom (1<sup>m</sup>8) of water on it, makes out 1 $\frac{1}{4}$  miles southerly from the point, and a bank, under 3 fathoms (5<sup>m</sup>5), makes out 2 $\frac{1}{2}$  miles southward and southeasterly from Fish Point. 10

A spot, with 7 feet (2<sup>m</sup>1) of water on it, lies on this bank, 160°, 1 $\frac{1}{2}$  miles from Fish Point. 15

**Chickenolee Reef**, with a least depth of one foot (0<sup>m</sup>3) over it, lies with its shoalest part bearing 080°, distant 2 $\frac{3}{8}$  miles from the extremity of Fish Point. From this spot, shoal water, under a depth of 2 fathoms (3<sup>m</sup>7) extends three-quarters of a mile eastward and a third of a mile westerly and with an extreme width, near its eastern end, of half a mile. 20

A spot, with 6 feet (1<sup>m</sup>8) of water on it, lies 275° half a mile from the above.

**South Bay.**—From Fish Point, the coast trends northeasterly 1 $\frac{1}{3}$  miles to the entrance to South Bay, a broad shoal indentation in the south shore. The shore bank, under 2 fathoms (3<sup>m</sup>7), makes out about three-quarters of a mile and 3 fathoms (5<sup>m</sup>5) will be found about a mile offshore. 25

**Mill Point** (*Lat. 41° 45' N. Long. 82° 37' W.*) is the southeastern point of Pelee Island.

Between South Bay and Mill Point is **Pelee Island South** post office.

Along the section of the coast from South Bay to Mill Point, deep water approaches to within half a mile of the shore, but 2 fathoms (3<sup>m</sup>7) will be found less than a quarter of a mile out.

A shoal, about half a mile long, and narrow, with 14 feet (4<sup>m</sup>3) least water on it, lies 1 $\frac{1}{2}$  miles south of Mill Point.

Another shoal, with 10 feet (3<sup>m</sup>0) least water on it, lies with its shoalest part one mile, 120° from Mill Point. The shoal, under 2 fathoms (3<sup>m</sup>7), extends one and one-quarter miles off Mill Point and under 3 fathoms (5<sup>m</sup>5) extends 2 miles from Mill Point, eastward. 35

From Mill Point, the shore trends about northward for 3 $\frac{3}{8}$  miles to **Middle Point**. Along the southern portion of this section the shorebank, under a depth of 3 fathoms (5<sup>m</sup>5), extends out less than half a mile but just south of Middle Point, shoal water extends off 1 $\frac{1}{2}$  miles. 40

A spot, with 8 feet (2<sup>m</sup>4) of water on it, lies 1 $\frac{1}{4}$  miles, 130° from Middle Point and on the same bearing, three-eighths of a mile nearer the point, 12 feet (3<sup>m</sup>7) of water will be found. 45

From Middle Point, the shore trends practically straight (with the exception of a slight projection at **Lizard Point**) northward 2 $\frac{1}{2}$  miles to Lighthouse Point. Along this stretch of coast, the 3-fathom (5<sup>m</sup>5) line is from one-half to one mile off shore.

## Chart 2183. United States charts 364, 36.

A spot, with 12 feet (3<sup>m</sup>7) of water on it, lies 042°, seven-eighths of a mile from Middle Point.

**Middle Island**, lying with its northeast point, 1 $\frac{7}{8}$  miles, 185° from Fish Point, is about three-quarters of a mile long east and west, terminating at its west end in a narrow ridge, and about 1,000 feet (304<sup>m</sup>8) wide. Shoal water makes off about 800 feet (243<sup>m</sup>8) from the south side and west end. Near the eastern end is an abandoned lighthouse tower.

**International Boundary.**—Middle Island is the most southerly portion of land in Canada. The International Boundary passes quite close to the south shore of the island; it also passes between Pelee Island and the **Bass Islands**, the latter being United States territory.

**Buoys.**—Four buoys are moored in the following positions, marking the International boundary in the vicinity, with bearing and distance from Southeast Shoal light. Light-and-bell-buoy "A", 10 $\frac{5}{8}$  miles, 154°; light-and-bell-buoy "B", 10 $\frac{7}{8}$  miles, 162°; light-and-bell-buoy "C", 12 $\frac{1}{8}$  miles, 211°, and can buoy "D", 16 miles, 234°. The light-buoys show a *flashing white* light *every 6 seconds*.

The above buoys are painted with white and orange vertical stripes.

**20 Hen Island**, the largest and most northerly of the Hen and Chicken group, lies 6 miles, 252° from Sheridan Point. It is about 700 feet (213<sup>m</sup>4) in diameter and shoal water makes out about 1,000 feet (304<sup>m</sup>8) from its east side, 700 feet (213<sup>m</sup>4) from its south and west sides and about 500 feet (152<sup>m</sup>4) to the north.

**25 Hen Island Shoal**, a rocky spot, with 18 feet (5<sup>m</sup>5) of water on it, lies 1 $\frac{1}{3}$  miles, 016° from Hen Island and being only five-eighths of a mile south of the course between Pelee Passage and West Sister Island lights might prove a menace to deep-draught vessels in heavy weather.

**30 Little Chicken Island**, lying 1 $\frac{1}{8}$  miles, 166° from Hen Island, is a small outcropping of a very shallow, rocky bank, extending five-eighths of a mile north and northwest from the island, three-eighths of a mile east and a quarter of a mile south. The deep channel, with from 3 to 5 fathoms (5<sup>m</sup>5 to 9<sup>m</sup>1), between this bank and the shorebank off Hen Island, is 1,000 feet (304<sup>m</sup>8) wide, its northerly edge being 1,000 feet (304<sup>m</sup>8) south of Hen Island.

**35** A spot, with only 2 feet (0<sup>m</sup>6) of water on it, lies 2,200 feet (670<sup>m</sup>6), 332° from Little Chicken Island.

**Big Chicken Island** is another outcrop near the western end of the same bank, on which lies Little Chicken Island. It is situated 1 $\frac{1}{3}$  miles westward from the latter.

**40** Shoal water extends five-eighths of a mile north, a quarter of a mile west and 200 yards (182<sup>m</sup>9) south of the island. The greatest available depth across the bank between Big and Little Chicken Islands is 18 feet (5<sup>m</sup>5).

**Chick Island**, very low, with some detached rocks northward of it, lies half a mile, 022° from Big Chicken Island.

**45** A group of three banks lies to the south of the Chicken Islands. On the western bank there is a spot of 11 $\frac{1}{2}$  feet (3<sup>m</sup>6) lying 1 $\frac{1}{4}$  miles, 195° from Big Chicken Island and another spot, with 12 feet (3<sup>m</sup>7) of water on it, lying 1 $\frac{1}{2}$

## Chart 2183. United States chart 36.

miles,  $210^{\circ}$  from the same. The northeasterly bank lies, with its shoalest spot of 10 feet ( $3^{\text{m}}0$ ),  $1\frac{1}{4}$  miles,  $148^{\circ}$  from Big Chicken Island. From this spot, shoal water extends three-eighths of a mile north and a quarter of a mile east.

The southeasterly bank has a least depth of 13 feet ( $4^{\text{m}}0$ ), lying  $2\frac{1}{8}$  miles,  $159^{\circ}$  from Big Chicken Island. 5

The deepwater channel between these banks and the Chicken Islands is about 1,800 feet ( $548^{\text{m}}6$ ) wide.

**East Sister Island** lies with its eastern point  $8\frac{1}{2}$  miles,  $269^{\circ}$  from Sheridan Point and  $3\frac{1}{4}$  miles,  $302^{\circ}$  from Hen Island. It is about five-eighths of a mile long easterly and westerly by a quarter of a mile in extreme width, near the western end. Shoal water makes off a quarter of a mile from the east and west ends, 200 yards ( $182^{\text{m}}9$ ) from the south side, and from the east end a bank makes off to the northwestward half a mile, nearly joining the bank extending southeasterly from North Harbour Island. 10 15

**East Sister Shoal** is a detached bank lying, with its shoalest spot of only 4 feet ( $1^{\text{m}}2$ ) of water, three-quarters of a mile,  $038^{\circ}$  from the east end of East Sister Island. From this spot, the shoal water, under 3 fathoms ( $5^{\text{m}}5$ ), extends three-eighths of a mile southwesterly, and an eighth of a mile northeasterly.

**North Harbour Island** (*Lat.  $41^{\circ} 50' N.$  Long.  $82^{\circ} 52' W.$* ), lying seven-eighths of a mile,  $325^{\circ}$  from the eastern end of East Sister Island, is located on a bank which extends a third of a mile north, a quarter of a mile east and a quarter of a mile southeasterly of the Island, where it nearly joins the bank from East Sister Island. 20

**North Harbour Island Reef**, with 2 feet ( $0^{\text{m}}6$ ) least water, lies with its shoalest spot  $1\frac{1}{2}$  miles,  $014^{\circ}$  from North Harbour Island. The reef, under a depth of 3 fathoms ( $5^{\text{m}}5$ ), extends southwesterly and northeasterly five-eighths of a mile and is about a quarter of a mile wide. 25

**Light-buoy.**—A black light-buoy, showing a *flashing white* light, and fitted with a radar reflector, is moored at the northern edge of the shoal. 30

## Chart 2183. United States chart 37.

**Middle Sister Island**, the northwesternmost of the group of islands in the west end of Lake Erie, lies  $7\frac{1}{2}$  miles,  $290^{\circ}$  from the west end of East Sister Island. It is a quarter of a mile long, northeast and southwest, by about half that width. With the exception of the south end, where shoal water makes off three-eighths of a mile, there is good water fairly close to the island. 35

**Light.**—A light is exhibited, at an elevation of 60 feet ( $18^{\text{m}}3$ ), from a steel tower, situated on the north end of Middle Sister Island.

## Chart 2183. United States chart 36.

**Coast.**—From Point Pelee, the shore gradually curves around northwestward to Leamington dock,  $10\frac{1}{2}$  miles from Pelee Point. Along this stretch of coast, deep water approaches to within three-eighths of a mile and there are no outlying dangers. 40

**Anchorage.**—Excellent anchorage is available to leeward of the peninsula. 45

**Sturgeon Creek**, a small unimportant stream enters the lake 2 miles southeasterly of Leamington dock.

## Chart 2183. United States chart 37.

**Leamington Wharf** extends 650 feet (198<sup>m</sup>1) in a southwesterly direction and thence 490 feet (149<sup>m</sup>4) in a southerly direction; thence a timber extension extends for 670 feet (204<sup>m</sup>2) in the same direction. At the outer end of the 5 main pier are a large warehouse, 301 feet (91<sup>m</sup>7) long, and a small warehouse. The depth alongside the warehouse is about 15½ feet (4<sup>m</sup>8).

**Breakwater.**—In 1957, a detached breakwater was under construction about 1,430 feet (435<sup>m</sup>9) southward of the outer end of Leamington wharf. *Flashing red* lights mark the ends of the construction work.

10 The town of **Leamington** lies about 1½ miles northward of the wharf. It is a station on the Michigan Central and Chesapeake and Ohio Railroads. A steamer makes daily trips between Leamington, Kingsville and Pelee Island.

15 **Lights.—Fog signal.**—A light is exhibited, at an elevation of 31 feet (9<sup>m</sup>4), from a lantern on the southern side of the warehouse on Leamington Wharf.

A hand fog horn answers signals from vessels approaching the wharf.

A light is exhibited, at an elevation of 26 feet (7<sup>m</sup>9), from a lantern on a white pole near the outer end of the Leamington Wharf extension.

## Chart 2183. United States chart 36.

20 **Crib.**—An iron crib, marking the outer end of the water-intake pipe, is situated 430 feet (131<sup>m</sup>1) eastward of the wharf and 100 feet (30<sup>m</sup>5) north-eastward of the inner bank of the dredged turning basin. There is a depth of 4 feet (1<sup>m</sup>2) over this crib which is marked by a buoy.

25 The H. J. Heinz Company's water intake extends from the shore 1,200 feet (365<sup>m</sup>8) east of the wharf, a distance of 1,700 feet (518<sup>m</sup>2) into the lake, bearing 206°. The crib at the outer end has a depth of 14 feet (4<sup>m</sup>3) over it, and it is marked by a buoy.

An old pile dock is located about 500 feet (152<sup>m</sup>4) west of the Government dock.

30 **Coast.**—From Leamington dock, the shore trends westerly 6½ miles to Kingsville. Along this part of the coast, the shore bank, under 3 fathoms (5<sup>m</sup>5) extends out from 500 yards (457<sup>m</sup>2) to half a mile with no outlying dangers.

**Belle Point** is a slight projection situated one mile west of Leamington Wharf.

35 **Kingsville** is an important shipping point for fish and farm produce and the harbour affords the best shelter between Pelee Point and Bar Point. It is a station on the Chesapeake and Ohio Railway. Steamers of the Windsor and Pelee Island Steamship Company call four times a week. During the summer steamers ply between Kingsville and Detroit, Toledo and Sandusky. The 40 district is popular as a summer resort, and is noted as being the location of the Jack Miner bird sanctuary.

The population, in 1956, was 2,884.

45 **Piers.**—The harbour consists of a small basin formed by two converging piers, about 200 feet (61<sup>m</sup>0) apart at the entrance. The east pier extends southward for 870 feet (265<sup>m</sup>1) from the shore; the west pier, irregular in shape, extends about 1,000 feet (304<sup>m</sup>8) southeastward to a position about opposite the end of east pier, thence 400 feet (121<sup>m</sup>9) southward and 420 feet (128<sup>m</sup>0)

## Chart 2183. United States chart 36.

eastward. There are some small wharfs at the head of the basin, some of which are in a poor state of repair. There is a small warehouse on the east pier.

**Depths.**—In 1956, there was a least depth of  $10\frac{1}{2}$  feet ( $3^{\text{m}}1$ ) in the entrance channel. At the east pier berth, a depth of  $10\frac{1}{2}$  feet ( $3^{\text{m}}1$ ) was available for a length of 500 feet ( $152^{\text{m}}4$ ). 5

**Lights.**—**Fog signal.**—A light is exhibited, at an elevation of 36 feet ( $11^{\text{m}}0$ ), from a mast on the outer end of the east pier at Kingsville.

A fog signal is sounded at the light.

A light is exhibited, at an elevation of 25 feet ( $7^{\text{m}}6$ ), from a steel structure 10 on the outer end of the west pier.

**Coast.**—About  $2\frac{1}{2}$  miles westward of Kingsville lies **Cedar Beach** at the mouth of **Cedar Creek**. The entrance to the boat harbour is protected by two breakwaters.

**Light.**—A light is exhibited, at an elevation of 18 feet ( $5^{\text{m}}5$ ), from a 15 lantern on a pole at the outer end of the east breakwater at Cedar Beach.

From Kingsville, the coast trends southwesterly  $4\frac{1}{4}$  miles and thence westward  $6\frac{1}{4}$  miles to Littles Point. Along the first part of this section, the shore bank, under 3 fathoms ( $5^{\text{m}}5$ ), extends out about five-eighths of a mile, gradually narrowing to about three-eighths of a mile near Littles Point, thence running 20 out about a mile, from the point.

**Littles Point** is a rounding projection,  $10\frac{1}{2}$  miles from Kingsville.

**Grecian Shoal**, the outer part of the above bank, lies with its shoalest spot of 12 feet ( $3^{\text{m}}7$ ) bearing  $206^{\circ}$ , seven-eighths of a mile from Littles Point. From this shoalest spot the shoal, under 3 fathoms ( $5^{\text{m}}5$ ), extends half a mile 25 west and joins the shore bank to the east.

**Buoy.**—A red spar buoy, moored a quarter of a mile south of the shoalest spot, marks the southerly edge of Grecian Shoal.

**Pigeon Bay** is an open bight between Pelee Point and Littles Point and the whole shore is taken up with summer residences. 30

**Colchester**, 11 miles westward from Kingsville, has a wharf which extends 593 feet ( $180^{\text{m}}7$ ) southward. From the outer end of the wharf, a breakwater extends eastward for about 830 feet ( $252^{\text{m}}9$ ), with a gap of 100 feet ( $30^{\text{m}}5$ ) towards the eastern end. In 1956, there were depths of less than one foot ( $0^{\text{m}}3$ ) at the wharf, but it is proposed to dredge the harbour area to 4 feet ( $1^{\text{m}}2$ ) 35 (1957).

**Oxley** is a little village  $2\frac{1}{2}$  miles east from Colchester and on the highway one-quarter of a mile from the shore.

**Colchester Reef** is a small spot under 3 fathoms ( $5^{\text{m}}5$ ), about a quarter of a mile in extent. It lies  $3\frac{3}{4}$  miles,  $152^{\circ}$  from Littles Point. 40

**Light.**—A light is exhibited, at an elevation of 64 feet ( $19^{\text{m}}5$ ), from a red, skeleton tower, with white, oval-shaped daymarks near the southwestern side of Colchester Reef.

## Chart 2183. United States chart 36.

**Buoys.**—A red, cylindrical bell-buoy is moored on the edge of the reef southward of Colchester Reef lighthouse (*Lat. 41° 56' N. Long. 82° 54' W.*).

5 A light-and-bell-buoy, fitted with a radar reflector, marked with black and white vertical stripes, and showing a *flashing white* light, is moored about 9 cables 192°, from Colchester Reef lighthouse.

**Wrecks.**—The vessel course from Pelee Passage to Detroit River passes half a mile to the south of Colchester Reef light and less than a quarter of a mile south of the wreck of the schooner *Armenia*, which lies 304°,  $3\frac{3}{8}$  miles from 10 Pelee Passage light, with 23 feet (7<sup>m</sup>0) over it.

While deep water exists on the north side of the light, the navigation of the passage north of Colchester Reef by large vessels, is rendered hazardous by the two following obstructions:

15 The wreck of the steamer *Grand Traverse* lying  $1\frac{1}{2}$  miles 353° from Colchester Reef light, has 23 feet (7<sup>m</sup>0) of water over it, forming a serious obstruction during low water periods and in stormy weather.

Another wreck lying  $2\frac{1}{8}$  miles, 066° from the light, has 23 feet (7<sup>m</sup>0) of water over it; it is dangerous, when this end of the lake is lowered by westerly gales, with a heavy sea rolling.

20 The wreck of the steamer *Charles B. Packard*, sunk in September 1906, is located  $10\frac{1}{4}$  miles, 091° from Colchester Reef light, and  $7\frac{3}{4}$  miles, 313° from Pelee Passage light.

**Light-buoy.**—The wreck of the *Armenia* is marked by a red and black, light-and-bell-buoy, fitted with a radar reflector, moored in 32 feet (9<sup>m</sup>8) of 25 water, and showing a *flashing white* light (*Lat. 41° 53' N., Long. 82° 38' W.*).

## Chart 2183. United States chart 37.

**Coast.**—From Little Point to Bar Point, at the entrance to Detroit River, the coast trends northwestward  $4\frac{3}{4}$  miles, and then gradually curves westerly, a further  $6\frac{1}{4}$  miles to Bar Point. Along the first 4 miles of this stretch, 30 the shore bank, under a depth of 3 fathoms (5<sup>m</sup>5), extends off about 600 yards (548<sup>m</sup>6), and then broadens out into the delta formed at the mouth of the Detroit River.

**Big Creek** enters the lake through marshy land three miles eastward of Bar Point.

## CHAPTER XII

### DETROIT RIVER

*United States chart 41.*

**Depths.**—The depths given for the Detroit River are referred to the sloping surface of the river corresponding to a Lake St. Clair stage of 573.5 (174<sup>m</sup>9) and a Lake Erie stage of 570.5 feet (173<sup>m</sup>9) above the Mean Sea Level, both being the Standard Low Water datums adopted by Canada and the United States. 5

**General description.**—The Detroit River is about 32 miles long, from its head at Windmill Point to Detroit River light at its mouth on Lake Erie, and varies in width from three-eighths of a mile to 3 $\frac{3}{4}$  miles. It is navigable for the largest vessels on the Great Lakes and carries an enormous tonnage of freight. The river is divided into two characteristic sections. The southerly section or lower river broadens out and is characterized by many islands and shallow expanses; in this section, running nearly north and south, the banks are more flatly sloping than in the upper river, and the bottom consists generally of earth and boulders, with the exception of about six miles north of the south end of Bois Blanc Island, where the bottom is mainly bed-rock and boulders. At Limekiln Crossing, in this rock section, the mean current velocity is about 2 miles and the maximum velocity about 4 miles per hour. The limitations imposed by the natural formation of the lower river bed have necessitated very extensive rock excavation and dredging to provide channels of suitable width and depth for the large vessels engaged in lake commerce. 10 15 20

The river channel, in the upper section, gradually swings around from the head of Fighting Island until, at the upper entrance, the general direction is northeasterward. In this section, the river is of unbroken cross section, except directly at its head, where it is divided by Peach Island and Belle Isle; in the upper river the water is deep, the bottom sand or mud, the channel banks are quite steep, and the current velocity is about 1 $\frac{1}{2}$  miles per hour. 25

**Fluctuations of water surface.**—Each year the river rises and falls about 2 feet (0<sup>m</sup>6) as measured by the monthly mean levels. Since 1900, the difference between the highest and the lowest monthly mean levels has been about 5 feet (1<sup>m</sup>5). However, occasional fluctuations in depth of several feet, "or **seiches**," produced by high easterly or westerly winds, respectively, raise or lower the water level at the west end of Lake Erie and similarly affect the level of the lower Detroit River; such changes have been as much as 6 feet (1<sup>m</sup>8) within 8 hours. (See page xxvii for seiches.) 30 35

**Lower Detroit River.**—In its natural state the broad and shallow formation of the lower river constituted a barrier to the development of through transportation in large vessels of deep draught. Government improvement has provided ample channels for two-way navigation, as herein described in detail. 40

**Note.**—There are a great many lights, beacons, light-buoys and other aids established in the Detroit River. Mariners should consult, for details, the United States Lake Survey chart No. 41 "Detroit River," the annual bulletin and the light lists. 45

*United States chart 41.*

**Warning to small craft.**—The attention of the owners and operators of small craft is directed to the dangers to which these craft subject themselves, when manœuvring or anchoring in the main ship channels of the Detroit and 5 St. Clair Rivers and Lake St. Clair. Owing to the heavy traffic in these comparatively narrow channels, large vessels cannot, in the large majority of cases, manœuvre to avoid a small craft crossing directly ahead of them, nor can they slow down rapidly to avoid the possibility of swamping small craft with their wash. The operation of small craft in these channels therefore presents a danger involving the possibility of loss of life to those in these craft, and of sending 10 a large vessel aground in the effort to avoid an accident.

Aside from the fact that common sense and prudence would indicate that small vessels should keep clear of these channels, the practice of anchoring these boats in or near the main ship canals is an offence against Federal law, 15 which may subject either owner or operator or both to fine and imprisonment.

United States coast guard vessels are actively patrolling these waters, not only to save life, prevent accidents and assist those in trouble, but they have the necessary authority to enforce the law.

**Regulations governing length of tow lines.**—On the connecting waters 20 of the Great Lakes, between Lake Huron light-vessel and the southerly limit of the improved channels of the Detroit River, terminating in Lake Erie, the length of tow line shall not exceed by more than 50 feet (15<sup>m</sup>2) the length of the scow, barge or vessel being towed; provided that no vessel, scow or barge shall be required to have a tow line less than 250 feet (76<sup>m</sup>2). The length of 25 tow lines shall be measured from the stern of one vessel to the bow of the following vessel.

Many of the buoys on the Detroit River are equipped with reflectors.

**Cable crossings.—Caution.**—Mariners are requested to exercise caution when anchoring in the Detroit River, where submarine cables have been placed. 30 Vessels should not anchor where there is danger of dragging over these cables.

**Regulations Governing the Passing of Vessels** in the improved channels connecting Lake Erie and Lake Huron:

(1) No vessel of 500 gross tons or over shall pass or attempt to pass another vessel of 500 gross tons or over moving in the same direction in the 35 following sections of the improved channels connecting Lake Erie and Lake Huron:

**Downbound.**—From buoy 1, above Fort Gratiot light to Port Huron traffic buoy. From Walpole Island upper light to St. Clair Flats range front light. From Windmill Point light to Belle Isle light. From Fighting Island 40 South light to junction Bar Point light-and-bell-buoy.

**Upbound.**—From junction Bar Point light-and-bell-buoy to Fighting Island south light. From Belle Isle light to Windmill Point light. From St. Clair Flats range front light to Harsens Island range front light. From St. Clair Middle Ground lower light-buoy to Stag Island upper light. From Port Huron 45 traffic buoy to buoy 1 above Fort Gratiot light: *Provided*, that a vessel at normal speed overtaking a tug towing a dredge or a scow bound in the same direction as the overtaking vessel may pass such tow, after the prescribed exchange of signals. Under such circumstances the tug shall not increase speed during the passing, and shall haul with its tow to the proper side of the channel 50 to allow passing room.

## United States chart 41.

(2) No vessel of 500 gross tons or over shall pass or attempt to pass another vessel of 500 gross tons or over moving in the same direction when such passing would bring more than two such vessels abreast in the sections in the St. Clair River referred to in (4) below. 5

(3) No vessel shall manœuvre so as to affect adversely the movement of another vessel when approaching any of the sections in the St. Clair River referred to in (4) below, nor attempt to obstruct traffic, nor unnecessarily retard a following vessel, nor increase speed after having signalled permission to an overtaking vessel to pass. 10

(4) **Downbound.**—West Channel, from Stag Island upper light to St. Clair Middle Ground lower light-buoy. From St. Clair Flats range front light to head Lake St. Clair buoy No. 33. 15

**Upbound.**—From head Lake St. Clair buoy No. 33 to St. Clair Flats range front light. From Harsens Island range front light to Walpole Island upper light. 15

**Channels.**—From deep water in Lake Erie to Detroit River light, a distance of  $4\frac{1}{2}$  miles, the channel, 1,200 feet (365<sup>m</sup>8) wide and 26 feet (7<sup>m</sup>9) deep, for both upbound and downbound traffic, passes to the eastward of the light. There is another channel passing to the westward of Detroit River light, 800 feet (243<sup>m</sup>8) wide and 22 feet (6<sup>m</sup>7) deep, extending about  $3\frac{1}{2}$  miles lakeward from its junction with the 1,200-foot (365<sup>m</sup>8) channel just north of the light. Under existing regulations, this channel may be used by downbound vessels moderately laden. Upbound vessels are prohibited from using this channel; these regulations do not apply to vessels under 100 gross tons. 20

From Detroit River light to Bar Point, about  $2\frac{1}{2}$  miles, the single channel for two-way traffic has a minimum width of 1,200 feet (365<sup>m</sup>8) and a least depth of 26 feet (7<sup>m</sup>9). From Bar Point to Ballards Reef, two channels are provided, the Amherstburg Channel, for upbound traffic being at least 21 feet (6<sup>m</sup>4) deep and 600 feet (182<sup>m</sup>9) wide, and the Livingstone Channel for downbound traffic being at least 26 feet (7<sup>m</sup>9) deep and 450 feet (137<sup>m</sup>2) wide. From the junction of these two channels at Ballards Reef to the head of Fighting Island, a distance of about 8 miles, there is a least depth of 26 feet (7<sup>m</sup>9) and a least width of 600 feet (182<sup>m</sup>9). From the head of Fighting Island to Lake St. Clair, a distance by steamer track of about 13 miles, the channel is 800 feet (243<sup>m</sup>8) or more in width, with a minimum depth of 25 feet (7<sup>m</sup>6), the point of least width being between the shoals at the head of Belle Isle and at the foot of Peach Island. 30

**The Amherstburg Channel**, for upbound traffic, is on the Canadian side of the river, passing to the eastward of Bois Blanc Island, with a total length of about 7 miles. This channel comprises several sections, the sides of which are marked by numerous buoys, and the courses by leading lights. 40

**Light.—Fog signal.—Radiobeacon.**—A light is exhibited, at an elevation of 55 feet (16<sup>m</sup>8), from a white, conical tower, the upper portion of which is black, at the southern entrance to the Detroit River. It is known as the Detroit River light. 45

A fog signal is sounded at the light, and a radiobeacon is operated.

**Low water signals for upbound channel.**—A light of amber colour is installed on the south side of the galley deck of Detroit River lighthouse visible in the direction of approach from Bar Point East Channel. A flood-lighted water gauge at this station shows readings to indicate the available draught in

United States chart 41.

the Amherstburg Channel. Notices to Mariners, issued from time to time, state the varying stages below which the amber light will show *flash 2 seconds, eclipse 2 seconds*. A fixed amber light will be displayed when the water level 5 is at or above these stages.

**Broadcast by radiophone of gauge readings.**—Detroit River light station will broadcast by radiophone, the Lake Carriers' Association gauge readings displayed at the light station. These broadcasts will be made twice daily at 9.30 a.m. and 9.30 p.m. Broadcasts will also be made at thirty-minute 10 intervals on the hour and half-hour whenever the gauge readings fall to or below the recommended draught.

**Light-and-bell-buoy.**—A light-and-bell-buoy, painted in red and black horizontal bands, is moored at the junction of the Amherstburg and Livingstone Channels; it shows a *quick-flashing white* light.

15 **Amherstburg**, 7 miles above Detroit River light, is a station on the Michigan Central Railway and on the Sandwich, Windsor and Amherstburg Electric Railway. The town and Bois Blanc Island serve as a pleasure resort during the summer months. In 1956, the population was 4,099.

**Wharves.**—The Public Wharf has a frontage of 250 feet (76<sup>m</sup>2) and has 20 a large warehouse on it. There are depths of about 20 feet (6<sup>m</sup>1) alongside. A few hundred feet north of the Public Wharf is the Department of Transport Wharf, with a length of 291 feet (88<sup>m</sup>7) on the river side, and a marine slip on the eastern side. There are two buildings on the wharf. In 1956, there was a depth of 9 $\frac{1}{2}$  feet (2<sup>m</sup>8) alongside the river face of this wharf. McQueens wharf 25 lies to the northward of the Transport wharf.

**Grosse Isle**, the largest island in the river, situated with its southern end 6 miles above Detroit River light, is about 8 miles long and with a greatest width of 1 $\frac{2}{3}$  miles toward the lower end. It is United States property and its upper end is abreast of the Michigan City of Wyandotte, a few miles below 30 Detroit.

It is connected to the Michigan shore at Trenton by a highway bridge.

Grosse Isle boat channel, along the southeastern side of Grosse Isle, runs from the middle of Livingstone Channel in a southwesterly direction, passing between Hickory and Sugar Islands. The channel is marked by conical and 35 can buoys and should be used by small motor-boats and pleasure craft, instead of the main channel.

**Celeron, Hickory, Sugar, and Elba**, four small islands near the southern end of Grosse Isle, and **Stony Island**, 3 miles above it, are all on the United States side of the International Boundary.

40 **Detroit River improved channels.**—From Lake Erie to the head of Fighting Island, a distance of about 13 miles, the upbound improved route has, in the order of naming, the following dredged channels, or reaches—Amherstburg (Upbound) Channel, comprising several reaches known as Bar Point Shoal Channel, Hackett Reach, and Amherstburg Reach; then Limekiln Crossing, 45 Ballards Reef Channel, and Fighting Island Channel.

These are briefly described in the following paragraphs.

United States chart 41.

**Caution.**—Extensive dredging operations are taking place in Amherstburg Channel. Mariners should consult the latest Notice to Mariners for the latest information and restrictions.

**The Amherstburg (Upbound) Channel** is the old improved channel on the Canadian side, passing to the eastward of Bois Blanc Island, with a total length of about 7 miles. It is 21 feet (6<sup>m</sup>4) deep and 600 feet (182<sup>m</sup>9) wide from Ballards Reef to its lower junction with the Livingstone Channel north of Detroit River light; thence the channel passing east of the light is 800 feet (243<sup>m</sup>8) or more in width and at least 25 feet (7<sup>m</sup>6) deep to deep water in Lake Erie. This channel comprises several sections or courses, as described below. The sides of the channel throughout its several courses are marked by numerous lights and buoys, in addition to the centre ranges provided. 5

**Bar Point Shoal.**—The improved channel through this shoal is 600 feet (182<sup>m</sup>9) wide, and 21 feet (6<sup>m</sup>4) deep, to its junction with the Livingstone Channel 15 north of Detroit River lighthouse; thence 800 feet (243<sup>m</sup>8) or more in width and at least 26 feet (7<sup>m</sup>9) deep to deep water in Lake Erie, passing to the east of the lighthouse.

**Hackett Reach.**—The section of the Amherstburg Channel starting about 500 yards (457<sup>m</sup>2) above Bar Point light-and-bell-buoy and ending the same 20 distance above Bois Blanc light is called Hackett Reach. The channel is 600 feet (182<sup>m</sup>9) wide and 21 feet (6<sup>m</sup>4) deep, and the centre line is marked by two leading lights (*fixed green* lights) at Amherstburg.

**Amherstburg Reach.**—The section of the river channel abreast Bois Blanc Island is known as the Amherstburg Reach. The channel is 600 feet (182<sup>m</sup>9) wide and 21 feet (6<sup>m</sup>4) deep, and the centre line is marked by two 25 leading lights (*fixed green* lights) on **Elliott Point**.

**Anchorage.**—Just south of the intersection of the Hackett Reach and the Amherstburg Reach, east of the channel, is an anchorage basin 2,000 feet (609<sup>m</sup>6) long, 300 feet (91<sup>m</sup>4) wide, and 19 feet (5<sup>m</sup>8) deep. 30

**Limekiln Crossing.**—The channel is 600 feet (182<sup>m</sup>9) wide and 21 feet (6<sup>m</sup>4) deep, and its centre line is marked by two leading lights (*fixed red* lights) on the Canadian side opposite Stony Island.

**Ballards Reef Channel**, through Ballards Reef, leads from Limekiln Crossing Channel to Livingstone Channel. The channel is 600 feet (182<sup>m</sup>9) wide, and its centre line is marked at the north end by two leading lights (*fixed green* lights) located near the north end of Grosse Isle, and at the south end by the **Fort Malden** leading lights (front light *fixed white*, rear light *fixed red*) on the Canadian shore. The depth is 26 feet (7<sup>m</sup>9) in the 2½ miles north of the junction with Livingstone Channel, where used for two-way traffic, and 40 21 feet (6<sup>m</sup>4) for about a mile south of that junction where normally used for upbound traffic.

There is also available an auxiliary channel about 14 feet (4<sup>m</sup>3) deep and 280 feet (85<sup>m</sup>3) wide, adjoining the 600-foot (182<sup>m</sup>9) channel on its easterly side and outlined by buoys. All vessels, whose draughts permit, should use this 45 auxiliary east channel in order to relieve the congestion in the available deep channel.

United States chart 41.

**Fighting Island Channel.**—The removal of the projecting points of shoals, which formerly extended from each side into the river channel west of Fighting Island, has secured a straight channel about  $4\frac{1}{2}$  miles long, with a least width of 800 feet (243<sup>m</sup>8), and a depth of 26 feet (7<sup>m</sup>9). Side lights and numerous light and spar buoys mark the limits of the improved channel.

**Anchorage.—Caution.**—An area of deep water adjoining the west side of the Fighting Island Channel at its southerly end is accessible as an anchorage ground, when conditions are unfavourable for proceeding through the confined deep channels leading thence southward into Lake Erie. Vessels using this anchorage should be careful to avoid the long shoal, extending below **Mamajuda Island** light to a point about 700 feet (213<sup>m</sup>4) south of the latitude of Grosse Isle south channel range front light, its extremity being marked by a red and black can buoy.

15 The western limits of the anchorage are marked by four black can buoys.

**The Livingstone (Downbound) Channel**, passing on the west side of Bois Blanc Island and Detroit River light, is about  $6\frac{1}{2}$  miles long and 26 feet (7<sup>m</sup>9) deep. At its northerly end it is widened out so as to provide a broad turn at its junction with the Amherstburg Channel at Ballards Reef. This channel is 20 450 feet (137<sup>m</sup>2) wide for a length of about 6 miles from its upper entrance to Bar Point, and 800 feet (243<sup>m</sup>8) wide thence to deep water at a point about  $3\frac{1}{2}$  miles lakeward from Detroit River light. The sides of the channel are marked by numerous lights and buoys, but no leading lights are provided.

25 There is also a channel passing west of Detroit River light, 800 feet (243<sup>m</sup>8) wide and 22 feet (6<sup>m</sup>7) deep, extending about  $3\frac{1}{2}$  miles lakeward from its junction with the 1,200-foot (365<sup>m</sup>8) channel just north of the light. Under existing regulations this channel may be used by downbound vessels moderately laden. Upbound vessels are prohibited from using this channel; the regulations do not apply to vessels under 100 gross tons.

30 **Bois Blanc Island**, opposite the lower end of Grosse Isle,  $1\frac{1}{4}$  miles long and one-third of a mile wide and close to Amherstburg, is Canadian territory and lies between the Amherstburg and Livingstone Channels. The island is a summer recreation ground and public park. The ferry wharf is situated on the east, or Amherstburg side of the island.

35 **Caution.—Cable.**—Mariners are cautioned not to anchor in the vicinity of a submarine telephone cable crossing from Murray Street, Amherstburg, to near the ferry wharf on Bois Blanc Island.

**Light.**—A light is exhibited, at an elevation of 56 feet (17<sup>m</sup>1), from a white, circular tower on the southern end of Bois Blanc Island.

40 **Caution when anchoring.**—Care should be exercised by vessels when anchoring in that part of the channel between Ballards Reef and the south end of Bois Blanc Island. The current at this locality may cause the anchor to drag and overturn rocks which may then become obstructions. Such dragging of anchors can probably be lessened or entirely avoided by paying out sufficient 45 length of chain before strain is brought to bear on the anchor.

**Light.—Fog signal.—Livingstone Channel upper entrance.**—A light is exhibited, at an elevation of 40 feet (12<sup>m</sup>2), from a white, skeleton tower on a square base, at the junction of the Livingstone and Amherstburg Channels. The tower is floodlighted at night.

50 A fog signal is sounded at the light.

*United States chart 41.*

**Caution.**—At the opening in the dykes of Livingstone Channel, affording passage to Sugar Island, the direction of the current crosses the channel at an angle of about  $30^{\circ}$ , to the southwest, with a normal velocity of about  $1\frac{1}{2}$  miles per hour. This is just above the north end of Bois Blanc Island. At the north end of Livingstone Channel the direction of the current is nearly parallel to that channel and across the Ballards Reef Channel, with a normal velocity of about 2 miles per hour. Ship's masters, particularly those of steamers with tows, when navigating these waters, should make due allowance for the drift of their vessels, and especially of the one being towed. See note, page 150. 10

**Fighting Island**, lying with its south point 3 miles above Livingstone Channel upper entrance light, is  $4\frac{1}{2}$  miles long and three-quarters of a mile wide, near the upper end. Two small islands, **Turkey** and **Grass**, lie between it and the main Canadian shore. Two miles below the lower end of Fighting Island, a shallow, marshy stream, **Rivière aux Canards**, flows in from the 15 Canadian shore.

From the south end of Fighting Island a shoal extends about  $1\frac{1}{2}$  miles southward.

**Buoy.**—A black spar buoy marks the extreme of this shoal.

**Light.**—**Grosse Ile.**—A light (*Lat.  $42^{\circ} 10' N.$ , Long.  $83^{\circ} 08' W.$* ) is 20 exhibited, at an elevation of 45 feet ( $13^m7$ ), from a white, octagonal tower, upper part pyramidal, on the east shore of Grosse Ile.

**Light.**—**Fighting Island south.**—A light is exhibited, at an elevation of 35 feet ( $10^m7$ ), from a red, skeleton tower with a small house on pier, on the east side of the southern entrance to Fighting Island Channel. 25

**Leading lights.**—**Grosse Ile South Channel.**—The front light is exhibited, at an elevation of 28 feet ( $8^m5$ ), from a square, pyramidal tower, with a white front and brown sides, near the north end of Grosse Ile; the rear light is exhibited, at an elevation of 53 feet ( $16^m2$ ), from a similar structure, 1,495 feet ( $455^m4$ ),  $342\frac{1}{2}^{\circ}$  from the front light. 30

They lead through the northern part of Ballards Reef Channel in continuation of the Fort Malden leading line.

**Fighting Island Channel** (See page 154) is marked by the following:

**Light.**—**Mamajuda Island.**—A light is exhibited, at an elevation of 25 feet ( $7^m6$ ), from a black, skeleton tower with a small house on concrete pier, 35 on the east side of Mamajuda Island (*Lat.  $42^{\circ} 11' N.$ , Long.  $83^{\circ} 08' W.$* ).

**Buoyage.**—The channel is marked by three black light-buoys, two black spar buoys, three red light-buoys and three red spar buoys.

**Light.**—**Grassy Island.**—A light is exhibited, at an elevation of 26 feet ( $7^m9$ ), from a black, skeleton tower with a small house on a concrete pier, on 40 the eastern side of Grassy Island.

**Upper Detroit River**, from Fighting Island to Lake St. Clair, is 15 miles in length, of uniform breadth and free from shoals or obstructions except for the large islands near the head. The channel at the head of Detroit River, from Belle Isle light to Lake St. Clair, is 800 feet ( $243^m8$ ) wide and 25 feet ( $7^m6$ ) 45 deep.

*United States chart 41.*

**Light.—Fighting Island north light.**—A light is exhibited, at an elevation of 35 feet (10<sup>m</sup>7), from a skeleton tower on a pier, on the eastern side of the northern entrance to Fighting Island Channel.

5      **Leading lights.—Grassy Island.**—The front light is exhibited, at an elevation of 30 feet (9<sup>m</sup>1), from a black, square, skeleton tower with a red daymark at the northern end of Grassy Island; the rear light is exhibited, at an elevation of 50 feet (15<sup>m</sup>2), from a black, skeleton tower with red daymark, 1,980 feet (603<sup>m</sup>5), 207° from the front light.

10     A passing light, visible all round the horizon, is exhibited at the front light.

**Alternative channel.**—To the east of Fighting Island a channel, with a minimum depth of 20 feet (6<sup>m</sup>1) exists, but it is narrow and winding. The lower and upper entrances are marked by spar buoys, but local knowledge is necessary to use this passage.

15     **La Salle**, Ontario, just below Windsor, lies behind Fighting Island and has landing wharves on the eastern inside channel. In 1956, the population was 2,703.

*United States charts 41, 416.*

**Windsor.**—The City of Windsor is situated on the Detroit River, its waterfront extending for a distance of about 11 miles from opposite the northern end of Fighting Island to abreast the upper part of Belle Isle. The former municipalities of **Ojibway**, **Sandwich**, **Walkerville**, and **East Windsor** have been annexed by Windsor. It is a station on the Canadian National, Canadian Pacific, Wabash, Michigan Central and Chesapeake and Ohio Railways; the 25 Windsor, Essex and Lake Shore Electric Railway and the Essex Terminal Railway for freight only. All kinds of supplies and stores for vessels can be obtained here. Repairs to vessels can be made at the wharves, but the port has no marine slip or dry dock. The population in 1956 was 121,980.

In the southern part of the city, formerly the town of **Ojibway**, the Canadian Steel Corporation Ltd., has a tract of 2,500 acres, with a frontage of nearly 2 miles, a short distance above Fighting Island. There are docks for unloading iron ore, with a slip 2,100 feet (640<sup>m</sup>1) long, 400 feet (121<sup>m</sup>9) wide on the harbour line and 200 feet (61<sup>m</sup>0) wide between dock fenders. In the **Sandwich** section, which has about 1½ miles of river frontage, there is shallow 35 water between the edge of the channel and the shore, a width of about 750 feet (228<sup>m</sup>6). Three coaling stations of the Empire-Hanna Coal Co. Ltd. are located here and have good docks and good water. In 1956, the slip in front of the Confederation Coal and Coke Company's dock, about 60 feet (18<sup>m</sup>3) wide and 600 feet (182<sup>m</sup>9) long, had a depth of 17 feet (5<sup>m</sup>2).

40     In Windsor proper, the harbour front is lined with docks and railway transfer slips, all of which have 3 to 4 fathoms (5<sup>m</sup>5 to 7<sup>m</sup>3) of water alongside. The berth in front of the Government dock, 700 feet (213<sup>m</sup>4) long, has a depth of 19 feet (5<sup>m</sup>8). The Canadian National Railways wharf is over 600 feet (182<sup>m</sup>9) long, with a railway track running the whole length. The depth of water alongside is 24 feet (7<sup>m</sup>3), with clay bottom. The Canadian Pacific Railway wharf is 700 feet (213<sup>m</sup>4) long, with a shed 500 feet (152<sup>m</sup>4) long by 46 feet (14<sup>m</sup>0) wide; two railway tracks run the full length; depth of water 24 feet (7<sup>m</sup>3) with clay bottom. The Michigan Central Railway wharf is 500 feet (152<sup>m</sup>4) long, with a railway track running the whole length of the wharf. The wharf belonging to J. T. Hurley & Co. is 250 feet (76<sup>m</sup>2) long and has 18 feet (5<sup>m</sup>5) of

*United States charts 41, 416.*

water alongside over clay bottom. The Detroit, Belle Isle and Windsor Ferry Company wharf is 300 feet (91<sup>m</sup>4) long and has a depth of 19 feet (5<sup>m</sup>8) with clay bottom. It is also used as a coal dock.

In the **Walkerville** district, the Walker distillery and grain elevators are conspicuous landmarks. Electric lights displayed at night form a good aid to navigation for passing through the main or Canadian Channel past Belle Isle. The company dock, 1,350 feet (411<sup>m</sup>5) long, has 25 feet (7<sup>m</sup>6) of water alongside. A track runs the whole length of the wharf. When there is a vessel moored at the elevators, the speed of passing vessels must be reduced. In the eastern part of the city, just above Walkerville, is the site of the Canadian plant of the Ford Motor Company; it has good docks equipped with unloading devices for ore and coal.

*United States chart 41.*

**Ambassador Bridge.**—This suspension bridge was completed in 1929; it connects Windsor and Detroit, and accommodates vehicular and pedestrian traffic. There is 152 feet (46<sup>m</sup>3) clearance for a width of 100 feet (30<sup>m</sup>5) at mid-channel, with 133 feet (40<sup>m</sup>5) at the harbour lines.

**Ferry.**—The Detroit, Belle Isle and Windsor Ferry Company's boats ply, every few minutes, between Windsor and Detroit. The Canadian National Railways, the Canadian Pacific Railway, and the Chesapeake and Ohio Railway transfer their freight on car ferries to and from Detroit.

**Tunnel.**—A vehicular tunnel affords direct communication between Windsor and Detroit.

**Shoals.**—A small boulder shoal, with 15 feet (4<sup>m</sup>6) least water on it, lies one-quarter of a mile above the Ambassador Bridge, 200 feet (61<sup>m</sup>0) off the Canadian shore and nearly opposite the old distillery wharf at that place. The outer portion of this shoal, with 18 feet (5<sup>m</sup>5) of water over it, is situated 450 feet (137<sup>m</sup>2) northeast of the shallow spot and about 400 feet (121<sup>m</sup>9) offshore.

A shoal, with 15 feet (4<sup>m</sup>6) least water on it, lies about 500 feet (152<sup>m</sup>4) off the United States shore, its middle point being about opposite the Detroit Customhouse. It is about 3,500 feet (1,066<sup>m</sup>8) long and very narrow.

**Buoys.**—A red and black horizontally-striped spar buoy is moored at each end of the latter shoal, and a red spar buoy marks the outer end of the former shoal.

35

**Power cable.**—A power cable, supported by two towers, 292 feet (89<sup>m</sup>0) in height, spans the river from close northward of the Canadian Salt Co. plant on the Canadian shore, to close eastward of the Detroit Edison Company Delroy power plant in Detroit. The minimum vertical clearance is 183 feet (55<sup>m</sup>8) above low water datum.

40

**Ports on the United States side.**—**Ecorse** is a village at the mouth of **Ecorse River**, and on the American Channel of the Detroit River 4 miles below the Rouge River; it has a salt block and other industries. The New York Central, Michigan Central, and Detroit, Toledo & Ironton Railroads pass through the town.

45

A narrow channel of deep water, marked by spar and light-buoys, lies along the river front inside of **Mud Island** and bank, but the available depth

*United States chart 41.*

is limited to 18 feet ( $5^m5$ ) in the north entrance to this channel, and also in the buoied passage outside of Mud Island leading to the south entrance.

**Wyandotte** is a manufacturing city, with a river front of 3 miles, situated 5 on the American Channel opposite **Point Hennepin** at the head of Grosse Isle, and 6 miles below the Rouge River. There are many important industries and good water all along the docks and riverfront.

**Caution.**—From the works of the Wyandotte Chemicals Corporation, located in the north part of Wyandotte, a pipeline, placed in a trench, extends 10 to Fighting Island, its location being indicated by a sign displayed near the channel on the east side. Vessels are requested not to anchor near the pipeline.

**Dry dock.**—The shipyard of the Great Lakes Engineering Works fronts 15 on the main channel about midway between River Rouge and Ecorse. The floating dry dock of the company comprises four sections, with a total length of 785 feet ( $239^m3$ ), bottom width of 86 feet ( $26^m2$ ), and depth on blocks of 18 feet ( $5^m5$ ).

**Bridge.**—There is a highway bridge just below Wyandotte, crossing the channel to Grosse Isle, with a clear channel width of 125 feet ( $38^m1$ ) on each 20 side of the pier supporting the draw span. The clear height of this bridge above water is 10 feet ( $3^m0$ ), and the bridge is closed except when vessels are passing.

**Channels.**—A channel 300 feet ( $91^m4$ ) wide and 21 feet ( $6^m4$ ) deep, marked by light and other buoys, has been dredged through the flats north of 25 Grassy Island, extending from the main river channel at the head of Fighting Island, southwesterly to the natural deep water in the American Channel along the front of Wyandotte. The improved Trenton Channel (see below) extends downstream from the deep water at Wyandotte.

From the American Channel in front of Wyandotte, a natural passage about 250 feet ( $76^m2$ ) wide and 21 feet ( $6^m4$ ) or more in depth extends southwesterly between the east side of Point Hennepin and Mamajuda Shoal opposite, 30 to an anchorage area off Grosse Isle, west of the southerly end of Fighting Island main vessel channel (see page 154). The passage and anchorage area are marked by light and other buoys.

**Trenton** is a village having a river front of about one mile, situated 35 on the west bank of the American Channel, opposite Grosse Isle, and about 10 miles below Rouge River. Downstream from the lower end of the natural deep water fronting Wyandotte, the American Channel of the river is obstructed by 40 shoals, through which Trenton Channel has been dredged 21 feet ( $6^m4$ ) deep and 150 to 250 feet ( $45^m7$  to  $76^m2$ ) wide; it extends to just below the lower bridge. The navigable depth thence down the back channel to the mouth of the river and Lake Erie is limited to 6 feet ( $1^m8$ ) through crooked and narrow reaches.

**Bridge.**—A highway bridge just below Trenton, crossing the channel to Grosse Isle, is of swing type, with a clear channel width of 150 feet ( $45^m7$ ) on each side of the centre pier and clear height above the water of 18.9 feet ( $5^m7$ ). 45 The bridge is closed except when vessels are passing. This bridge is about  $3\frac{1}{4}$  miles downstream from the bridge below Wyandotte, above described.

**Gibraltar**, a village on the west bank of the American Channel about 4 miles below Trenton, formerly had a shipyard, but is now of little importance except to summer residents.

*United States chart 41.*

**Season of navigation.**—The dates of opening and closing of navigation during the last 10 years are as follows:—

	Opening	Closing	
Earliest date .....	Feb. 3	Dec. 1	5
Latest date .....	Mar. 18	Dec. 31	
Average date .....	Feb. 28	Dec. 15	

### RULES AND REGULATIONS FOR NAVIGATING THE LOWER DETROIT RIVER

The following Rules and Regulations, which have received the joint 10 approval of the Governments of the United States and the Dominion of Canada, will govern the navigation of the channels of lower Detroit River, effective September 5, 1936.

#### *Definitions*

The Lower Detroit River is that portion of the Detroit River between 15 the Mamajuda Light and Lake Erie.

Speed under these rules shall in all cases be speed over the bottom.

These rules shall replace all rules and regulations heretofore published for navigating the Lower Detroit River.

#### *Regulations*

20

**Rule 1.**—No vessel of 100 gross tons or over shall navigate the Livingstone Channel at a rate of speed greater than twelve statute miles per hour between its junction with the Amherstburg Channel at Ballards Reef and the Bar Point lighted bell-buoy; nor the Amherstburg Channel at a rate of speed greater than twelve statute miles per hour between the south end of Bois Blanc Island and the north lighted buoys at Ballards Reef, and where the width of this channel is restricted by improvements in progress, through such restricted width of channel the speed shall not exceed eight statute miles per hour. 25

**Rule 2.**—Downbound freight vessels shall pass through the Livingstone Channel as far as the Detroit River light. Deep laden vessels shall then enter 30 Lake Erie through the 1,200-foot (365<sup>m</sup>8) channel passing east of the lighthouse, while light draft vessels and moderately laden vessels may enter Lake Erie through the old downbound channel west of the light.

All upbound vessels shall enter the Detroit River via the channel east of the Detroit River lighthouse and pass through Amherstburg Channel. 35

Vessels under 100 gross tons, and vessels making local stops along these routes, are exempt from this rule.

**Rule 3.**—Passenger vessels may use the Amherstburg Channel downbound, but should they pass down through the Livingstone Channel they shall be subject to the rules governing that channel. 40

**Rule 4.**—All upbound light-draught vessels and all passenger vessels using the Amherstburg Channel shall pass through the auxiliary channel to the eastward of the improved channel at Ballards Reef. This auxiliary channel is 280 feet (85<sup>m</sup>3) wide and 14.5 feet (4<sup>m</sup>5) deep at low water datum.

**Rule 5.**—No vessel shall pass another vessel bound in the same direction 45 in that portion of Livingstone Channel between its junction with Amherstburg

*United States chart 41.*

Channel at Ballards Reef and Bar Point lighted bell-buoy nor at any other portion of either channel where the width of the channel is restricted by improvements in progress. Between any two downbound vessels entering or 5 navigating that portion of Livingstone Channel between its junction with the Amherstburg Channel at Ballards Reef and Bar Point lighted bell-buoy there shall be a time interval of not less than five minutes.

Tugs without tows and vessels under 100 gross tons are exempt from this rule.

10 *Rule 6.*—Any vessel approaching a tug with a tow moving in the same direction may pass such tow by giving a signal indicating upon which side the vessel desires to pass, and it shall be the duty of the pilot of the tug to steer clear of the side of the channel indicated and give the passing vessel all possible room.

15 *Rule 7.*—No vessel shall anchor within the limits of either channel except in distress or under stress of weather. Any vessel so anchored shall be moved as quickly as possible to such anchorage as will leave the channel clear for the passage of vessels.

20 *Rule 8.*—No vessel shall tow another through any of the improved channels unless such vessel moves the tow at least five miles per hour over the bottom; and no vessel of ten gross tons or over shall navigate the improved channels under sail power alone.

25 *Rule 9.*—All vessels passing dredges, drill scows, derrick scows, or other stationary plant engaged on improvements to the channels are required to slacken their speed, when given a signal by three distinct blasts of the steam whistle.

*Rule 10.*—No vessel shall pass or attempt to pass another vessel or vessels moving in the same or opposite directions at any place in Lower Detroit River, in such a position that more than two vessels will be abreast when passing.

30 *Rule 11.*—Three long blasts of the steam whistle, when sounded from a patrolling vessel, will indicate that the vessel to which such signal is given is proceeding at too high a rate of speed, and such vessel must immediately moderate her speed accordingly.

35 *Rule 12.*—Four long blasts of the steam whistle, when sounded from a patrolling vessel, will indicate that the vessel to which such signal is given must stop until further orders from the patrolling vessel.

*Rule 13.*—One long blast followed by four short blasts, when sounded from a patrolling vessel, will indicate that the vessel to which such signal is given may proceed on her course.

40 *Rule 14.*—A vessel aground in or near a channel, or a vessel from which any accident is not under command, shall show from sunset to sunrise, at a height of not less than 20 feet (6<sup>m</sup>1) nor more than 40 feet (12<sup>m</sup>2) above the hull, two lights in a vertical line one above the other and not less than 6 feet (1<sup>m</sup>8) apart and so fixed as to be visible to both up and downbound vessels.

45 The upper of these lights shall be red. If the nature of the accident is such that the channel is closed, the lower of these lights shall also be red. But if the nature of the accident is such that vessels can pass in safety, the lower of these lights shall be white.

*United States chart 41.*

Such vessels shall not show the lights required for a vessel at anchor.

Such vessel shall, if the accident has closed the channel, sound a signal of several short and rapid blasts of the steam whistle to any approaching vessel, whereupon the approaching vessel shall stop and repeat this signal to any vessel coming up astern of her. 5

But if the accident has not rendered passing unsafe, such vessel shall sound a signal of three distinct blasts to any approaching vessel, whereupon the approaching vessel shall answer with the same signal of three distinct blasts and shall reduce her speed and pass with caution. 10

Such vessel shall in no case give or answer a passing signal without first giving several short and rapid blasts of the steam whistle.

It shall be the duty of the Master of the first vessel passing such vessel to report the place and nature of the accident to the next marine reporting station or patrol boat. 15

15

*Rule 15.*—Whenever vessels collect in any part of the river by reason of fog, smoke, ice, or the obstruction of any of the channels, their anchorage and movements in such channels shall be under the direction and control of the officer in whose jurisdiction such vessels have collected. Regular scheduled boats carrying passengers or mail may be advanced in order, and any vessel not ready to move when directed shall lose her position. The Masters of all vessels are required to yield prompt obedience to the orders of the proper authorities. 20

20

*Rule 16.*—While in performance of their duties, all orders of the officers in charge of traffic on the lower Detroit River as above indicated shall be obeyed. Any violation of such orders and any violation of the above rules and regulations shall subject the offender to the penalties made and provided by the laws of the countries interested. Any such violation to be immediately reported by the officer noting the same to his immediate superior for transmission in the proper way. The report should state on which side of the boundary the violation occurred. 25

25

With a view to facilitating traffic and to avoid a dispute as to jurisdiction of traffic within the limits of the Lower Detroit River, boats shall carry out the orders of the representative of either Government in the absence of the representative of the other, and the two officers in charge shall make such local arrangements as will avoid any possibility of conflict of authority. 30

30

*Rule 17.*—In the case of any vessel, boat, water craft, raft, or other similar obstruction sinking or grounding or being unnecessarily delayed in any navigable waters in such a manner as to stop, seriously interfere with, or specially endanger navigation in the opinion of either or both of the officers in charge of navigation in the Lower Detroit River, these officers shall in addition to any authority otherwise granted by their respective Governments, have full power to stop all vessels and direct their anchorage, clear the channel, designate the order in which all vessels shall proceed after the channel is opened, and shall do all other things necessary and proper to expedite the passage of vessels. 40

40

*Rule 18.*—In all cases where the foregoing rules are not applicable the attention of masters is directed to the Pilot Rules for the Great Lakes and their connecting and tributary waters.

Complaints arising under these rules are to be addressed to the United States Engineer in Charge, Room 605, Federal Building, Detroit, Michigan, or 50 to the Harbour Master at Amherstburg, Ontario.

45

*United States charts 416, 41.*

**Belle Isle.**,  $2\frac{1}{2}$  miles long and one mile wide at the upper end, lies with its eastern end about 2 miles from the head of Detroit River. The whole of the island is laid out as a park and is the property of the City of Detroit. Its 5 southern shore is comparatively free from shoals. The main ship channel passing to the south of Belle Isle is wide and deep.

**Shoal.**—From the western end of Belle Isle a shoal, with  $4\frac{1}{2}$  feet ( $1^{\text{m}}4$ ) of water near the outer end, extends westward for 900 yards ( $823^{\text{m}}0$ ).

**Light-buoy.**—A light-buoy with red and black horizontal stripes, fitted 10 with a radar reflector, and showing *quick-green flashes*, is moored near the outer end of this shoal.

**Light.**—A light is exhibited, at an elevation of 77 feet ( $23^{\text{m}}5$ ), from a cream-coloured lookout tower at the Coast Guard station on the southeast point of Belle Isle.

**15 Coast Guard Station.**—A life-boat is located and storm signals are displayed at the station on the southeast point of Belle Isle.

**Peach Island**, lying in the entrance to Detroit River, is a mile long and three-eighths of a mile wide, near the eastern end. It is surrounded by shoal water.

**20 The American Channel**, north of Belle Isle, is crooked and is little used except for local and pleasure craft. The north side of the entrance to the channel is marked by a black light-buoy, showing a *flashing white* light, about opposite Peach Island Shoal light, and by a black light-buoy, showing a *flashing green* light, opposite the red and black light-buoy at the head of Belle 25 Isle. The very shallow **Scott Middle Ground**, outlined by buoys, exists between the island and the main shore; the channel north of this middle ground has a width of 600 feet ( $182^{\text{m}}9$ ) with a depth of 18 feet ( $5^{\text{m}}5$ ) or more.

**Lights.**—A light is exhibited, at an elevation of 22 feet ( $6^{\text{m}}7$ ), from a red mast on a small house on a concrete pier, at the entrance to the waterworks 30 lagoon at the northeastern end of Belle Isle.

A light is exhibited, at an elevation of 40 feet ( $12^{\text{m}}2$ ), from a grey, stone tower on a pier. This light marks the Detroit waterworks intake crib in the American Channel, about five-eighths of a mile westward of the lagoon light.

**Buoy.**—A black can buoy, located 1,950 feet ( $594^{\text{m}}3$ ) westward of the crib 35 light, marks the north bank of the channel.

**Bridge.**—There is a highway bridge across the American Channel, connecting Detroit with Belle Isle, which is a city park. The bridge is composed of arched concrete spans, without draw, the middle three spans having a vertical clearance of 32 feet ( $9^{\text{m}}8$ ). Vessels requiring a greater height must pass to the 40 south of Belle Isle.

**Detroit.**—The waterfront of Detroit extends along practically the entire upper 13 miles of the river from Lake St. Clair to the head of Fighting Island, including the American Channel at Belle Isle, described above. There are shelving beaches with shallow water inside of the harbour line at and above 45 Belle Isle, but the bank of the undivided river section below the island is well

*United States charts 416, 41.*

built out to deep water and occupied by numerous industries and docks, the latter having ample accommodations for the varying classes of vessels which use them.

**Shoal.—Buoy.**—A small shoal off the foot of First Street, with about 17 feet ( $5^{\text{m}}2$ ) of water over it, is marked by a red and black spar buoy. 5

*United States chart 415.*

The **Rouge River** constitutes a branch channel of the harbour of Detroit, and the related industrial district also extends down the west channel of the lower Detroit River to Ecorse, Wyandotte, and Trenton. (For these, see page 157.) 10

The town and port of **River Rouge** is located on this stream close to the mouth, and forms part of the greater industrial Detroit City. A short-cut canal, with 21-foot ( $6^{\text{m}}4$ ) depth, leads directly into Rouge River and affords a quicker and straighter route to the Ford Company plant than by the more winding natural stream. 15

**Light-buoy.**—A red light-buoy, showing a *flashing red* light, is moored off the north side of the entrance to the canal.

**Light.—Peach Island.—Light-buoy.**—A light is exhibited, at an elevation of 32 feet ( $9^{\text{m}}8$ ), from a red, skeleton tower on a concrete base, on the edge of the shoal northwestward of Peach Island. 20

A red light-buoy, showing a *flashing red* light, marks the western edge of the shoal extending westward from Peach Island.

**Light.—Livingstone Memorial.—Light-buoys.**—A light is exhibited at an elevation of 58 feet ( $17^{\text{m}}7$ ), from a white, pyramidal, monumental structure on the eastern end of Belle Isle. 25

A red and black light-buoy, showing a *quick-flashing white* light, is moored at the junction of the channels eastward of Belle Isle.

A black light-buoy, showing a *flashing white* light, is moored about 1,600 feet ( $457^{\text{m}}7$ ) east-northeastward of the above buoy, and marks the northern side of the channel. 30

**Light.**—A light is exhibited, at an elevation of 42 feet ( $12^{\text{m}}8$ ), from a white, conical tower on Windmill Point, northward of Peach Island.

**Riverside**, Ontario, is the continuation of Windsor and is located on the Canadian shore opposite the upper end of Belle Isle, and at the head of Detroit River. 35

**Little River** flows into the Detroit River about half a mile east of the Town of Riverside. On the west side near its mouth is located the plant of the Peerless Construction Company. In 1939, the channel of the Little River leading up to the plant was dredged to a depth of 16 feet ( $4^{\text{m}}9$ ).

**Directions for upbound traffic.**—Enter the dredged channel outside Detroit River light, between the red light-and-bell-buoy and the black light-buoy marking the outside end and steer  $344^{\circ}$  for  $2\frac{1}{4}$  miles passing about 200 yards ( $182^{\text{m}}9$ ) east of Detroit River light; bring it astern, bearing  $187^{\circ}$ , and steer  $007^{\circ}$  for one-half mile, to enter the channel. When between light-buoys 13D and 14D, alter course to  $011^{\circ}$  and proceed thus about  $1\frac{3}{4}$  miles until the Amherstburg leading lights are in one, bearing  $015^{\circ}$  whence steer for them on that course until Elliott Point leading lights come in line astern bearing  $176^{\circ}$ . 40 45

*United States chart 415.*

Now steer  $356^{\circ}$  until the Limekiln Crossing lights come in line bearing  $003^{\circ}$ ; steer for them on that course until Fort Malden leading lights come in line astern, bearing  $163^{\circ}$ , when steer  $343^{\circ}$  until Grosse Isle leading lights come in sight, on the same course, ahead. Hold this course, until Fighting Island south light bears  $038^{\circ}$ , when enter Fighting Island Channel and steer  $004^{\circ}$  until Fighting Island north light is abeam, and Grassy Island leading lights are in line astern, bearing  $207^{\circ}$ , and steer  $027^{\circ}$  until one mile below the bridge, whence hold a mid-channel course, until abreast the buoy moored at the extremity of the spit extending from the western end of Belle Isle. Leave it on the port hand. Then steer  $084^{\circ}$  for  $1\frac{1}{2}$  miles, when change to  $071^{\circ}$  and continue in mid-channel until Belle Isle light bears  $297^{\circ}$ , whence alter course to  $040^{\circ}$  and pass to port of red light-buoy 4 and between Peach Island shoal light and the black and red horizontally-striped light-buoy. Then steer  $067^{\circ}$  for about  $2\frac{1}{4}$  miles, 10 with the William Livingstone Memorial light astern, which will lead to the southwestern entrance of Grosse Point Channel (Lake St. Clair).

**Directions for downbound traffic.**—Entering the head of the river on a course of  $247^{\circ}$ , steer on William Livingstone Memorial light until Peach Island shoal light is abeam to port, when steer  $225^{\circ}$  through the channel between Peach Island and Belle Isle until Belle Isle light bears  $297^{\circ}$ , when change to  $251^{\circ}$  for  $1\frac{3}{4}$  miles. Then alter course to  $264^{\circ}$ , and hold this course until abreast the buoy marking the extremity of the spit extending from the west end of Belle Isle, leaving it on the starboard hand. Hold a mid-channel course until one mile below the bridge, and, when Grassy Island north channel leading lights 20 are in line, bearing  $207^{\circ}$ , steer for them on this course until Fighting Island north light is abeam. Alter course to  $184^{\circ}$ , enter Fighting Island Channel, hold this course until Fighting Island south light bears  $038^{\circ}$ , and with Grosse Isle south channel leading lights in line astern, bearing  $343^{\circ}$ , steer  $163^{\circ}$  with Fort Malden leading lights ahead, on the same course. Keep this course until abreast 25 the black light-and-bell-buoy, moored a quarter of a mile above Livingstone Channel upper entrance light, when haul gradually into this channel. When about a mile above Detroit River light, change course to pass to the eastward of the light. Downbound vessels, moderately laden, may pass westward of Detroit River light.

**Caution.—Buoys.**—Steel nun and can, unlighted buoys have been established to replace wooden spars at practically all locations along the main channels within the Detroit River, Lake St. Clair and St. Clair River. These buoys constitute a marked improvement over the wooden spars formerly used. In some locations, particularly the entrances to the Detroit River, wooden spars 30 have been repeatedly destroyed, because of steamers running them down and cutting them off with their propellers. In the lower Detroit River, this has been due chiefly to vessels leaving or entering the marked channels at various points there without regard to the buoys.

Vessel masters are cautioned that fouling of these steel buoys, which are 45 moored with  $\frac{3}{4}$ -inch chain, will not only result in damage to the buoy with resulting expense of repairs chargeable to the responsible vessel, but also might readily be the cause of damage to the vessel herself, should the chain become entangled in the steamer's propeller.

**Special Warning.**—It shall be unlawful for any person to obstruct or 50 interfere with any aid to navigation established or maintained in the Coast Guard under the Commandant of the Coast Guard, or to anchor any vessel in any of the navigable waters of the United States, so as to obstruct or interfere

*United States chart 415.*

with range lights maintained therein, and any person violating the provisions of his section shall be deemed guilty of a misdemeanor, and be subject to a fine not exceeding the sum of \$500 for each offence, and each day during which such violation shall continue shall be considered as a new offence. This also shall apply, with equal force and effect, to any private aid to navigation lawfully maintained under the authority granted the Secretary of the Treasury and the Commandant of the Coast Guard.

**Ice** usually forms in the river about December 1 and breaks up about April 15.

5

10

## CHAPTER XIII

### LAKE ST. CLAIR

#### DIMENSIONS, SURFACE ELEVATIONS, ETC.

*United States chart 42.*

5 The depths given in this chapter are referred to low-water datum, which, for Lake St. Clair, is an elevation of 573.5 feet (174<sup>m</sup>3) above mean tide at New York.

Length on about Longitude 82° 45' W.....	26 miles
Breadth on about Latitude 42° 25' N.....	24 miles
Rainfall Average annual.....	34 inches

	U.S.	Canada	Total	
Area, Water surface.....	180	280	460	square miles
Entire Drainage Basin.....	2,310	4,110	6,420	square miles
High Water, Highest monthly mean since 1900, July 1952.....				Elev. 577.52
Low Water, Lowest monthly mean since 1900, Jan. 1936.....				Elev. 571.68
Mean Level, 1898 to 1956, inclusive, 59 years.....				Elev. 573.50
Datum for Canadian harbour improvements.....				Elev. 574.89
Below mean level of Lake Huron.....				Elev. 5.71
Above mean level of Lake Erie.....				Elev. 2.53
Season of navigation				
St. Clair River.....			Opening Mar. 19	Closing Dec. 15
Detroit River.....			Feb. 28	Dec. 15

General description.—Lake St. Clair is an expansive shallow basin, having low and marshy shores and flatly sloping bottom formation, and with a 10 maximum natural depth of about 21 feet (6<sup>m</sup>4).

Irregular depths of from 2 to 18 feet (0<sup>m</sup>6 to 5<sup>m</sup>5) extend out from the shore all around the lake at distances varying from one to 7 miles, and local knowledge is required in approaching the shore, which may be done only with light-draught vessels. The lake owes its importance mostly to the ship channel 15 improvements which constitute a connecting link in the through waterway from Lake Erie to Lake Huron. There are no commercial or industrial communities located around the shores, although considerable traffic exists up the Sydenham and Thames Rivers.

The ship channel for large vessels, trending northeast and southwest 20 through the lake, has been provided by the construction of St. Clair Flats Canal and by dredging across the lake and in the Grosse Pointe Channel leading to the head of the Detroit River, affording a through depth of 25 feet (7<sup>m</sup>6). The minimum width is 700 feet (213<sup>m</sup>4) at the upper end and a width of 800 feet (243<sup>m</sup>8) across the lake. An earth dike, about 7,200 feet (2,194<sup>m</sup>6) long, lies along the 25 easterly side of the channel at South Channel outlet.

**Special Regulations for navigating the channels in Lake St. Clair.**—Small craft of less than 100 gross tons, except tugs regularly engaged in commercial towing, shall not approach closer than 1,000 feet (304<sup>m</sup>8) to a cargo vessel of over 100 gross tons in the channels in Lake St. Clair between the 30 southerly end of the dike at the St. Clair Flats Canal and Peach Island at the head of the Detroit River.

**Caution.—Buoys.**—See page 164.

United States charts 416, 42.

**Grosse Pointe Channel.**—This ship channel, dredged through the shoal at the foot of Lake St. Clair and leading from the deep water at the head of the Detroit River, is an almost straight cut  $11\frac{1}{4}$  miles long, 800 feet (243<sup>m</sup>8) wide and 25 feet (7<sup>m</sup>6) deep. The channel is subject to shoaling along the sides. Depths adjacent to the channel vary from 12 to 15 feet (3<sup>m</sup>7 to 4<sup>m</sup>6). 5

**Leading lights.—Peach Island.**—These leading lights are built on cribs northward of Peach Island and lead through Grosse Pointe channel to their intersection with the leading lights at St. Clair Flats. The front light is exhibited, at an elevation of 38 feet (11<sup>m</sup>6), from a black, pyramidal tower, upstream face white, about  $1\frac{1}{4}$  miles northeastward of Peach Island; the rear light is exhibited, at an elevation of 66 feet (20<sup>m</sup>1), from a black, conical tower, 3,558 feet (1,084<sup>m</sup>5), 228° from the front light. 10

A passing light, visible all round the horizon, is exhibited at the front light.

**Buoyage.**—The northwesterly side of Grosse Pointe Channel is marked by four black light-buoys, with the one nearest Windmill Point showing a *quick-flashing white* light, and the others showing a *flashing white* light; opposite each of these buoys is moored a red light-buoy, showing a *flashing red* light, and with a bell on the buoy farthest offshore. The channel is also marked by can and conical buoys in pairs. 15 20

United States chart 42.

**Light.—Fog signal.**—A light is exhibited, at an elevation of 52 feet (15<sup>m</sup>8), from a white, square tower at the turn in the channel on the western side. It is known as Lake St. Clair light.

A fog bell is sounded at the light-tower. 25

**Buoyage.**—A red light-buoy, showing a *flashing red* light, is moored at the turn in the channel opposite the lighthouse. Between the lighthouse and the dike, the channel is marked by two red and two black light-buoys showing *flashing red* and *flashing white* lights, respectively. The channel is also marked by two pairs of can and conical buoys. 30

United States charts 42, 43.

**Lake St. Clair Ship Channel.**—This improvement consists of a channel for deep draught vessels, about 17 miles long, extending from the head of Detroit River northeasterly across the lake to the outlet of the South Channel of the St. Clair River. There is a depth of 25 feet (7<sup>m</sup>6) in the entire channel. From the head of Detroit River to a point 10,000 feet (3,048<sup>m</sup>0) below the St. Clair Flats Canal dike, the width is 800 feet (243<sup>m</sup>8). From this point to the canal entrance the width gradually decreases to 700 feet (213<sup>m</sup>4). This width is carried through the canal, a distance of 7,200 feet (2,194<sup>m</sup>6), and the depth is 25 feet (7<sup>m</sup>6). Along the whole length of the canal on the easterly side is a rubble-mound breakwater with riprapped slopes. 35 40

United States chart 42.

**Lights.—Buoys.**—The channel at the St. Clair Flats Canal is marked on its easterly side by three lights located at the lower end, the middle and upper end of the rubble-mound dike, each showing a *flashing red* light. The west side of the channel, opposite the above lights, is marked by three black light-buoys, each showing a *flashing green* light, and also by two black can buoys at intermediate points between the light-buoys. 45

*United States chart 42.*

The old channel, at its outer end, is  $1\frac{1}{2}$  miles northwesterly from the canal and its upper end connects with the south channel just above the dike. From the 12-foot (3 $m$ 7) contour on Lake St. Clair to its connection with the main channel, it has a length of  $2\frac{3}{4}$  miles, with a depth, over a narrow and irregular width, of not more than 9 feet (2 $m$ 7). It provides passage for small vessels, yachts, and other craft of light draught, which can thus avoid passing through the canal channels used by the many large carriers. Two leading beacons mark the course of the outer portion of this channel; the first beacon shows a *white flashing* light; the rear beacon is not lighted. The sides of the channel are marked in part by two black can buoys and four red conical buoys, all with white reflectors.

The entrance to Middle and North Channels, the northerly mouths of the Detroit River, have been marked by buoys for the use of light draught vessels.

15      **South shore of Lake St. Clair.**—From the head of the Detroit River, the south shore of Lake St. Clair trends eastward for a distance of 11 miles to Belle River and thence to the mouth of the Thames River, in the southeast corner of the bay,  $13\frac{1}{2}$  miles. The shore is straight with the exception of a wide, gradual curve at Stony Point. The London-Windsor branch of the Canadian 20 National Railways follows along the shore.

**Askins Point**, 2 miles eastward of Peach Island, is a very small village on the Windsor and Tecumseh Electric Railway.

**Tecumseh**,  $1\frac{1}{2}$  miles south of Askins Point, is a station on the Canadian National Railways and the terminus of the Windsor and Tecumseh Electric 25 Railway. The population in 1956 was 4,209.

**Pike Creek** is a small stream entering the lake  $4\frac{1}{4}$  miles from Peach Island. The village of Pike Creek, a station on the Canadian National Railways, is one mile south of the mouth of the creek. The entrance to the creek has a depth of 5 feet (1 $m$ 5).

30      **Rivière aux Puces**, another small stream, enters the lake  $3\frac{1}{2}$  miles east of Pike Creek. The village of **Puce**, near the mouth of the river is a station on the Canadian National Railways.

Training works at the mouth of the river provide a harbour for small craft. The entrance channel has a depth of 5 feet (1 $m$ 5) and a width of 40 feet (12 $m$ 2).

35      **Belle River**, a station on the Canadian National Railways, 17 miles from Windsor, is a village with a population of 1,814 in 1956. The entrance channel is protected on the eastern side by a wall 1,967 feet (599 $m$ 5) in length, which extends 1,387 feet (422 $m$ 8) into the lake, this outer portion being of concrete supported by timber piling. The inner 580 feet (176 $m$ 8) is built of steel sheet 40 piling. On the west side of the river entrance is a wall 330 feet (100 $m$ 6) long, also of steel sheet piling construction.

In 1956, a channel with a least depth of 6 feet (1 $m$ 8) and a width of 60 feet (18 $m$ 3) was dredged from the lake to the railway bridge crossing Belle River.

**Light.**—A light is exhibited, at an elevation of 22 feet (6 $m$ 7), from a lantern on a pole on the outer end of the east breakwater at Belle River.

**Ruscom River**,  $4\frac{1}{2}$  miles east of Belle River, is shallow and unimportant.

*United States chart 42.*

**Stony Point** is a wide rounding point, with the extreme of the point about 8 miles east of Belle River. The shore is lined with boulders.

**Stony Point Village**, half a mile from the shore, is a station on the Canadian National Railways. There is a Government wharf, with a frontage of 100 feet ( $30^m5$ ), and a depth of one foot ( $0^m3$ ) along the face. 5

**Thames River** empties into the southeasterly corner of Lake St. Clair. The entrance channel across the shallows of the lake is approximately 8,100 feet ( $2,468^m9$ ) long and 100 feet ( $30^m5$ ) wide. It is subject to silting and requires frequent dredging. In 1947, the channel was dredged to a least depth of 10 feet ( $3^m0$ ). In 1956, the least depth in the channel was reported to be 7 feet ( $2^m1$ ) at chart datum. A depth of 11 feet ( $3^m4$ ) is reported to be available to Chatham, situated about  $18\frac{1}{2}$  miles from the mouth of the river. The river is navigable for 5-foot ( $1^m5$ ) draught to Louiseville, about 7 miles above Chatham. There are several lift bridges over the river, up to Chatham. Three water and gas mains cross the river; anchorage in their vicinity must be avoided. 10 15

**Leading lights.**—A light is exhibited, at an elevation of 22 feet ( $6^m7$ ), from a red, square, wooden structure with open framework, on the south shore at the mouth of the Thames River; the rear light is exhibited, at an elevation of 55 feet ( $16^m8$ ), from a white, circular, stone tower with a red lantern, 300 feet ( $91^m4$ ),  $147^{\circ}$  from the front light. 20

**Buoyage.**—A black light-buoy, showing a *flashing white* light, is moored about  $2\frac{1}{4}$  miles,  $328^{\circ}$  from the front leading light at the mouth of Thames River. The entrance channel is marked by four red and four black spar buoys.

**Wharf.**—Just inside the mouth, there is a wharf on the south side near the leading lights; it is 185 feet ( $56^m4$ ) in length, with a depth of 10 feet ( $3^m0$ ) along the face. Opposite to this, on the north side, are some buildings, principal of which is the Log Cabin Inn. There is a small landing wharf here. 25

A motor ferry crosses the river at this point.

One-half mile above the mouth, a water-main and a submerged power cable cross the river and should be guarded against when anchoring. 30

**Baptiste Creek** enters from the south side three-quarters of a mile above the entrance lights, and one-half mile farther up and on the south side is a cut dredged through the flat, low land for three-quarters of a mile to **Jeanette Creek station** of the Canadian National Railways. The mouth of **Jeanette Creek** is a mile and a third beyond this cut. There is an irregular-shaped wharf on the west entrance point to Jeanette Creek, with a total length of 306 feet ( $93^m3$ ). The depth along the face is about 6 feet ( $1^m8$ ). 35

One mile above Jeanette Creek at a bend in the river, the river road commences at **Bradleys** where there is a ferry crossing, and follows the north shore of the Thames to Chatham. One and a half miles farther upstream, on the south side, the Tecumseh road strikes the river at **Roszell** farm, and follows the south shore to Chatham. 40

**Depths.**—Along this section of the river the mid-channel depths range from 14 to 20 feet ( $4^m3$  to  $6^m1$ ) at the standard low water datum of Lake St. Clair. The river is 400 feet ( $121^m9$ ) wide between banks. 45

At 6 miles above the mouth, the Thames becomes more tortuous and at this point is located **St. Peters church** on the south bank. Just above this

*United States chart 42.*

church and on the north bank, where the river turns sharply northward, is **Bagnell Point**, with an old red brick cottage. The township line road strikes the river at this point. Bagnell Point is  $6\frac{7}{8}$  miles above the rivermouth.

5      **Prairie Siding** is a station on the Canadian National Railways  $8\frac{3}{4}$  miles upstream from the mouth and on the south shore, where the river makes a sharp horseshoe bend. A quarter of a mile farther upstream, or about 9 miles from the mouth, a bascule bridge crosses the stream. It has a clearance of 14 feet (4 $m$ 3) at mean high water and it connects the river and Tecumseh roads.

10     This Prairie Siding, or **Jacob Road bridge**, is  $8\frac{4}{5}$  miles above the mouth. About 4 miles above the bridge, where the Winter line road intercepts the river road on the north shore is **Paine Court** dock, and a quarter of a mile farther up on the south bank, **Johnstone dock**.

15     The Thames maintains its width and depth until about the Winter line road, or Paine Court dock, where the depths shoal to from 12 to 15 feet (3 $m$ 7 to 4 $m$ 6), and the width to 250 to 300 feet (76 $m$ 2 to 91 $m$ 4). For two and a half miles below the Third Street bridge in Chatham, the depths range from 8 to 10 feet (2 $m$ 4 to 3 $m$ 0) and the stream's width through the city is about 200 feet (61 $m$ 0).

20     **Chatham**, a thriving manufacturing city and centre of a rich farming district, is situated  $18\frac{1}{2}$  miles up the Thames River, or  $18\frac{1}{10}$  miles from the river mouth to the Third Street bridge in Chatham. It is on the Canadian Pacific, Canadian National, Wabash and Chesapeake and Ohio Railways. In 1956, the population was 22,262.

25     **Mitchell Point**.—The shore from the mouth of the Thames River trends first northeasterly  $3\frac{1}{2}$  miles and then north 5 miles to Mitchell Point. Extending south from Mitchell Point,  $3\frac{1}{4}$  miles, is a string of low flat, marshy islands lying from a half to three-quarters of a mile offshore.

30     **Mitchell Bay** lies in the northeast corner of Lake St. Clair between Mitchell Point and **Ste. Anne Island**.

**Mitchell Bay Village**, at the head of Mitchell Bay, has a wharf 368 feet (112 $m$ 2) long, with a dredged and buoyed channel leading to it, 50 feet (15 $m$ 2) wide with 6 feet (1 $m$ 8) of water.

35     **Leading lights**.—Leading lights are shown at Mitchell Bay Village. The front light is exhibited, at an elevation of 21 feet (6 $m$ 4), from a mast with a white, diamond-shaped daymark on the inner end of the wharf; the rear light is exhibited, at an elevation of 30 feet (9 $m$ 1), from a white mast, 215 feet (65 $m$ 5), 045° from the front light. The lights in line, bearing 045°, lead from the dredged channel to the wharf.

40     A channel, 50 feet (15 $m$ 2) wide with 6 feet (1 $m$ 8) of water, has been dredged, leading from the cut outside Mitchell Bay wharf to Chenal Ecarte about  $1\frac{1}{4}$  miles above Martin Island leading lights. This channel is in three sections starting at a point 1,600 feet (487 $m$ 7) outside the front leading light, running at 289° for 4,725 feet (1,440 $m$ 2) then changing to 346° for 5,345 feet (1,629 $m$ 2) and then running 328° into Chenal Ecarte.

**Leading lights**.—Leading lights are shown for the last course of the channel leading to Mitchell Bay wharf dredged channel. The front light is exhibited, at an elevation of 23 feet (7 $m$ 0), from a mast with a white, diamond-shaped daymark about 1,500 feet (457 $m$ 2) southward of the Mitchell Bay

*United States chart 42.*

Village leading lights; the rear light is exhibited, at an elevation of 31 feet (9<sup>m</sup>4), from a similar structure, 190 feet (57<sup>m</sup>9), 109° from the front light.

**Buoyage.**—The turn in the channel northward, from the above leading lights, is marked by a black light-buoy, showing a *flashing white* light and a red spar buoy. A black spar buoy is moored close northward of the light-buoy.

**Second Channel.**—A passage into Chenal Ecarte, known as Second Channel, has been deepened to 6 feet (1<sup>m</sup>8) over a width of 50 feet (15<sup>m</sup>2) for 4,350 feet (1,325<sup>m</sup>9) out into the lake, from the front leading light on Martin Island. 10

**Leading lights.**—A light is exhibited, at an elevation of 28 feet (8<sup>m</sup>5), from a pole with a white, diamond-shaped daymark, on the east end of **Martin Island** (Lat. 42° 28' N., Long. 82° 27' W.); the rear light is exhibited, at an elevation of 36 feet (11<sup>m</sup>0), from a similar structure, 270 feet (82<sup>m</sup>3), 355° 15 from the front light.

The lights lead through Second Channel to Chenal Ecarte.

**Buoys.**—Second Channel is marked by three red and three black spar buoys.

**Coast.**—The shore from Mitchell Bay trends westward 11 miles to St. Clair Flats Canal, and is very irregular, having numerous projections and indentations. The St. Clair River empties through its various mouths into the lake along this part of the shore, off which the water is extremely shallow. 20

About the mouth of Chenal Ecarte are a number of shooting camps. **Ste. Anne Club** lies on a small islet in Chenal Ecarte, half a mile above 25 St. Martin lights.

**West, or United States Shores of Lake St. Clair.**—From the head of Detroit River at Peach Island, for 8 miles up the west shore, to **Gaukler Point**, a succession of suburban communities extends, known in order as **Grosse Pointe Park**, **Grosse Pointe Village**, **Grosse Pointe Farms** and **Grosse Pointe Shores**. At each village, there are landing piers with 6 to 10 feet (1<sup>m</sup>8 to 3<sup>m</sup>0) of water and extending into the lake from 600 to 1,800 feet (182<sup>m</sup>9 to 548<sup>m</sup>6). **Point Huron** is a marshy projection about 17 miles north from Detroit River and through it the **Clinton River** discharges into the lake—a narrow and crooked stream with an improved dredged channel, 7 feet (2<sup>m</sup>1) 35 deep, leading upstream for 8 miles to **Mount Clemens**.

**Anchor Bay** is the shallow northwest arm of Lake St. Clair receiving the waters of the North Channel of the St. Clair River. It has maximum depths of 11 feet (3<sup>m</sup>4) in its central portion, shoaling gradually to the shoreline. It is separated from the main lake by a bank across which only 8 or 9 feet (2<sup>m</sup>4 or 2<sup>m</sup>7) can be carried. 40

**New Baltimore** is a village, with several industries, on the northern shore of Anchor Bay. Its docks have only about 6 feet (1<sup>m</sup>8) of water.

Limiting navigable depth, from Lake Erie to Lake Huron, by the improved waterways of the Detroit River, Lake St. Clair, and St. Clair River, 45 is 25 feet (7<sup>m</sup>6) for downbound, and 21 feet (6<sup>m</sup>4) for upbound traffic, (maintained under normal water level conditions) in the St. Clair Flats Canal.

## CHAPTER XIV

### ST. CLAIR RIVER

*United States charts 43, 42.*

**Datums.**—The depths given for the St. Clair River are referred to the 5 sloping surface of the river corresponding to a Lake Huron stage of 578.5 (176<sup>m</sup>4) and a Lake St. Clair stage of 573.5 (174<sup>m</sup>8) above Mean Sea Level at New York. Both stages correspond to the Standard Low Water datums adopted by Canada and the United States.

**General description.**—The St. Clair River has two characteristic 10 sections, the lower or delta portion, and the upper deep channel. The delta section extends from Lake St. Clair to the head of Chenal Ecarte where the several branches of the river unit. The most important one, used for through navigation, is called South Channel, and it connects with the improved channel of Lake St. Clair via the St. Clair Flats Canal.

15 The distance from the lower end of St. Clair Flats Canal, along the South Channel, to Chenal Ecarte is about 13 miles. A depth of 25 feet (7<sup>m</sup>6) in the downbound and 21 feet (6<sup>m</sup>4) in the upbound channel is maintained.

20 The upper channel runs from the head of Chenal Ecarte to Lake Huron, a distance of 27 miles, making the total length of the steamship track from Lake St. Clair to Lake Huron about 40 miles. There are two islands in the upper part of the river, Woodtick and Stag Islands, with good channels on both sides of them.

**Currents.**—The river leaves Lake Huron with a velocity, opposite Fort Gratiot light of about 5 miles per hour, and enters Lake St. Clair with a velocity 25 through the canal of about 2 miles per hour; at intermediate points the velocity varies irregularly between these limits. The banks of the river are clay and sand and are usually quite steep; there are no rocks.

The discharge of the St. Clair River during the 56-year period, 1900-1955, has averaged 177,700 cubic feet per second.

30 **Caution.—Low water levels.**—In seasons of extreme low water levels, mariners should particularly note the recommended draughts, as announced in "Notices to Mariners" and memoranda issued periodically by the various Government marine authorities.

**South Channel, St. Clair Flats.**—This channel is the main route of 35 through navigation, and pursues a sinuous course. From the head of the St. Clair Flats Canal, for about 2½ miles, the general trend is about northeast with a string of low islands on each side, then curving somewhat southerly; then easterly through the so-called "Southeast Bend" for 2½ miles and again taking a northeasterly direction for 6½ miles to abreast the Russell Island Shoal 40 light-buoy. This channel has ample depth. The United States shore is characterized by many summer cottages and club-houses with landing for excursion and summer resort traffic.

The South Channel has been deepened to 25 feet (7<sup>m</sup>6) or more, for a minimum width of 700 feet (213<sup>m</sup>4), through the Southeast Bend section and for a 45 width of 1,000 feet (304<sup>m</sup>8) or more elsewhere.

Many of the buoys on the St. Clair River are equipped with reflectors.

## United States charts 43, 42.

The numerous shoal passages between the islands of the United States shore, many of them used as motor-boat channels, are known locally as "highways", and lead from the main steamer channel back into the extensive shallow waters of **Big and Little Muscamoot Bays**. From here through similar "highways" that separate the islands bordering Middle Channel and Chenal à Bout Rond, small craft run back and forth cross the delta flats.

5

**Old West Channel**, through the flats into the lake, leads from the head of St. Clair Flats Canal and is marked by a number of spar buoys and one light, the front light of the old range. This channel has only from 9 to 10 feet (2<sup>m</sup>7 to 3<sup>m</sup>0) of water in it over the flats.

**Leading lights.**—St. Clair Flats leading lights are shown on the north shore about 1 $\frac{1}{2}$  miles above the head of the canal. The front light is exhibited, at an elevation of 48 feet (14<sup>m</sup>6), from a skeleton tower with a white daymark; the rear light is exhibited at an elevation of 108 feet (32<sup>m</sup>9), from a pyramidal tower with a white daymark, 4,000 feet (1,219<sup>m</sup>2), 041° from the front light. A passing light, visible from 230° through south to 030°, is exhibited at the front light.

15

**Lights.**—A light (No. 13) is exhibited, at an elevation of 26 feet (7<sup>m</sup>9), from a mast with a white daymark, on the north side of the channel close 20 eastward of the rear leading light.

A light (No. 17) is exhibited, at an elevation of 26 feet (7<sup>m</sup>9), from a white, cylindrical tower, about five-eighths of a mile eastward of light No. 13.

A light (No. 12) is exhibited, at an elevation of 18 feet (5<sup>m</sup>5), from a white, pyramidal tower, on the south shore, almost abreast of light No. 13. 25 It is known as **Maybury Highway** light.

A light (No. 18) is exhibited, at an elevation of 23 feet (7<sup>m</sup>0), from a white, pyramidal tower, on the south shore opposite Bedore.

A light (No. 20) is exhibited, at an elevation of 23 feet (7<sup>m</sup>0) from a white, pyramidal tower at the eastern entrance point to Little Bassett Channel 30 on the south shore of Southeast Bend.

A light (No. 21) is exhibited, at an elevation of 27 feet (8<sup>m</sup>2), from a mast with a white, square daymark on the north shore eastward of light No. 20. It is known as **Harsens Island light**.

A light (No. 25) is exhibited, at an elevation of 26 feet (7<sup>m</sup>9), from a white, cylindrical tower, half a mile eastward of light No. 21 on Harsens Island.

A light (No. 27) is exhibited, at an elevation of 26 feet (7<sup>m</sup>9), from a black, latticed mast, with a white, diamond-shaped daymark on Harsens Island at the eastern end of Southeast Bend.

A light (No. 26) is exhibited, at an elevation of 23 feet (7<sup>m</sup>0), from a white, pyramidal tower, on the south shore of Southeast Bend, opposite light No. 25.

**Bassett Channel.**—Just east of Canada Club wharf, at the eastern end of Southeast Bend, a branch channel, known as Bassett, flows southward through the marshes to Lake St. Clair. It is unbuoyed, but has depths of from 27 to 9 feet (8<sup>m</sup>2 to 2<sup>m</sup>7) in it, and ends in St. Clair Flats in 1 $\frac{1}{2}$  to 2 feet (0<sup>m</sup>4 to 0<sup>m</sup>6) of water. It is 5 miles in length, and used by motor-boats with local knowledge.

45

United States charts 43, 42.

**Chematogan Channel**, narrow and quite shallow in places, leaves the river on the east bank, half a mile below Russell Island lower front light and flows southward for 8 miles to the lake, to end in the weed beds of St. Clair 5 Flats.

**Squirrel Island** is that part of the delta land lying between Bassett and Chematogan Channels.

**Light.**—A light (No. 30) is exhibited, at an elevation of 26 feet (7<sup>m</sup>9), from a white dolphin, close westward of the junction of the South and Bassett 10 Channels.

**Harsens Island** is that portion of the delta, partially cultivated and populated, that is confined between North and Middle Channels on the north and west, and the St. Clair Main, or South Channel on the east and south.

**Cable.**—A cable crosses the channel from Harsens Island to a point near 15 the Canada wharf.

**Leading lights.—Harsens Island.**—Leading lights are shown on the eastern side of Harsens Island at Tashmoo Park. The front light is exhibited, at an elevation of 27 feet (8<sup>m</sup>2), from a white, cylindrical tower in 3 feet (0<sup>m</sup>9) of water off the shore of the island; the rear light is exhibited, at an elevation 20 of 31 feet (9<sup>m</sup>4), from a skeleton tower with a white daymark, 525 feet (160<sup>m</sup>0), 023½° from the front light.

**Lights.**—A light (No. 36) is exhibited, at an elevation of 23 feet (7<sup>m</sup>0) from a white, pyramidal tower, on the east bank about half a mile below the above leading lights.

25 A light (No. 37) is exhibited, at an elevation of 28 feet (8<sup>m</sup>5), from a mast with a white diamond-shaped daymark, on the west bank close northward of Tashmoo Park. It is known as **Grande Point** light.

A light (No. 38) is exhibited, at an elevation of 18 feet (5<sup>m</sup>5), from a white, pyramidal tower, on the east bank near the upper end of Squirrel Island.

30 **Leading lights.—Russell Island.**—Leading lights are shown at Russell Island, situated at the junction of South and North Channels. The front light is exhibited, at an elevation of 18 feet (5<sup>m</sup>5), from a latticed mast with a diamond-shaped daymark, on the east shore of Russell Island; the rear light is exhibited, at an elevation of 33 feet (10<sup>m</sup>1), from a skeleton mast with a 35 square-shaped daymark, 2,000 feet (609<sup>m</sup>6), 042° from the front light.

**Light.**—A light (No. 41) is exhibited, at an elevation of 18 feet (5<sup>m</sup>5), from a white lamphouse on a post, on the northeastern end of Russell Island.

**Russell Island**, (*Lat. 42° 37' N., Long. 82° 32' W.*) lying between South and North Channels, is about 1,650 yards (1,508<sup>m</sup>7) long and 600 yards (548<sup>m</sup>6) 40 wide at the widest place near the north end. It is the extreme northeastern end of Harsens Island, joined to the latter by marshy land. Two small passages, known as **Nipigon** and **Indian Cuts**, cut through this land joining the islands. They are navigable only for small boats.

**Russell Island Shoal** extends northeasterly about 1,000 yards (914<sup>m</sup>4) 45 from Russell Island.

*United States charts 43, 42.*

**Channel.**—The east and northeast parts of the original shoal have been removed in order to enlarge and straighten the entrance to the Main or South Channel. The channel at this locality is now 25 feet (7<sup>m</sup>6) deep for a minimum width of 1,000 feet (304<sup>m</sup>8). 5

**Algonac** is a village and summer resort on the United States shore opposite Russell Island and at the head of North Channel. It has wharves with 12 to 15 feet (3<sup>m</sup>7 to 4<sup>m</sup>6) of water.

**Light-buoy.**—On the west side of the dredged cut at the north end of Russell Island Shoal, a red and black horizontally-striped cylindrical buoy 10 showing an *interrupted quick-flashing white* light is moored in 20 feet (6<sup>m</sup>1) of water.

**Walpole Island** is the large tract of delta land whose northern extremity is at the upper entrance of Chenal Ecarte, and is bordered on the west by St. Clair River and Chematogan Channel (*see page 174*), and on the east by 15 Chenal Ecarte and Johnston Channel, (*see page 176*).

**Wharf.—Light.**—On the western side of Walpole Island is a wharf, 356 feet (108<sup>m</sup>5) long, with a depth of 15 feet (4<sup>m</sup>6) alongside the outer end; it provides accommodation for ferry and general shipping service. There is a Custom House near the wharf. A light is exhibited from a pile cluster on the 20 outer end of the wharf.

**Lights.**—Walpole Island light (*Lat. 42° 36' N., Long. 82° 31' W.*) is exhibited, at an elevation of 25 feet (7<sup>m</sup>6), from a mast with a white daymark, about 3,000 feet (914<sup>m</sup>4) northeastward of the upper end of Squirrel Island.

Walpole Island lower light (No. 40) is exhibited, at an elevation of 25 18 feet (5<sup>m</sup>5), from a white, pyramidal tower off the northwest corner of the government wharf.

Walpole Island upper light (No. 42) is exhibited, at an elevation of 23 feet (7<sup>m</sup>0), from a white, pyramidal tower, 4,300 feet (1,310<sup>m</sup>6) northward of the lower light. 30

**Dickinson Island** is that portion of the delta lying between North and Middle Channels.

**North Channel (St. Clair River Delta).**—At the light-buoy at the head of Russell Island (*see above*), opposite Algonac, the North Channel branches off and winds westward for 10½ miles into Anchor Bay of Lake St. Clair. It 35 passes north of Harsens and Dickinson Islands; it is from 27 to 70 feet (8<sup>m</sup>2 to 21<sup>m</sup>3) deep, except where it flows through the shallow flats in Anchor Bay, where the depth is only 6 to 7 feet (1<sup>m</sup>8 to 2<sup>m</sup>1). A number of buoys mark the course over these flats, here known as **Baltimore Channel**.

Opposite the point of the mainland at the mouth of North Channel, a 40 smaller branch channel, **Chenal à Bout Rond**, debouches from North Channel, southwestward for 4 or 5 miles, ending in the flats of **Goose Bay**.

**Middle Channel**, with 20 to 30 feet (6<sup>m</sup>1 to 9<sup>m</sup>1) of water in its main portion, and 6 to 7 feet (1<sup>m</sup>8 to 2<sup>m</sup>1) where it winds through the flats of Anchor Bay, opposite Point Huron, leaves the North Channel at 4 miles from Russell Island light-buoy. The dividing point of North and Middle Channels is marked by a horizontally-striped light buoy, showing a *quick-flashing white* light. 45

United States charts 43, 42.

**Chenal Ecarte** branches off from St. Clair River to the eastward about  $1\frac{3}{4}$  miles above Russell Island. It is very narrow, winding, and should be navigated only by those well acquainted with its waters. **Baby Point** is the 5 north entrance point of Chenal Ecarte. (**Chenal Ecarte** and **Sydenham River**, see below.)

**Leading lights.—Chenal Ecarte.**—Leading lights are shown on the south bank of Chenal Ecarte, near its junction with the St. Clair River. The front light is exhibited, at an elevation of 10 feet (3 $m$ 0), from a mast with a black 10 and white daymark; the rear light is exhibited, at an elevation of 25 feet (7 $m$ 6), from a similar structure, 200 feet (61 $m$ 0), 138° from the front light.

**Buoy.**—A red spar buoy is moored at the entrance of the channel leading to Chenal Ecarte. It must be left to starboard in making the entrance.

**Wharf.**—Just inside the Chenal Ecarte leading lights at Highlands is a 15 small wharf, with a face 40 feet (12 $m$ 2) in length.

**Chenal Ecarte and Sydenham River Route.**—From the St. Clair River mouth of Chenal Ecarte, at Baby Point and the entrance leading lights on the north end of Walpole Island, the Chenal Ecarte leads southeast for  $1\frac{1}{4}$  miles and thence a little east of south in three gentle bends for  $3\frac{3}{4}$  miles, whence it turns 20 east for nearly one mile to Johnston Point.

**Johnston Channel** flows south from this point, winding, narrow, with varying depths, for 13 miles, to end in one or 2 feet (0 $m$ 3 or 0 $m$ 6) of water in the marshy, shallow flats of Lake St. Clair. From Johnston Point, the Chenal Ecarte, 200 feet (61 $m$ 0) in width, swings eastward and then southward for  $1\frac{3}{4}$  25 miles to **Dark Bend**. In this stretch it has least depths in mid-channel of 18 feet (5 $m$ 5). Thence it flows eastward a quarter of a mile to **Baldoon**, or **Scagel Bend**, with the same limiting navigable depth; then south one mile to **Devil's Elbow Bend**; and thence one-half mile east to its junction with the mouth of the Sydenham River.

30 The total distance from St. Clair River to Sydenham River mouth by Chenal Ecarte is  $9\frac{1}{4}$  statute miles.

From the mouth of Sydenham River, the Chenal Ecarte then trends southward, winding and irregular, and with varying depths for 9 miles to its Lake St. Clair outlet at the Martin Island lights and buoys channel leading into 35 Mitchell Bay. (See page 170.)

The limiting depth available in Chenal Ecarte from Lake St. Clair to Sydenham River is that in the dredged channel in Mitchell Bay, which is about 6 feet (1 $m$ 8).

The marshy land formed between Johnston Channel on the west and 40 Chenal Ecarte on the east is known as **Ste. Ann Island**, and is an Indian Reserve.

From **Irwin's Point**, where the Johnston Channel commences, a roadway follows the north and east bank of the Chenal Ecarte to Arnold's farm, whence the road leaves the river bank and strikes east. The governing depth in this 45 curve, Johnston Bend, around the head of Ste. Anne Island, is  $18\frac{1}{2}$  feet (5 $m$ 7).

A frame house stands in Irwin's Point, 150 feet (45 $m$ 7) back from the river bank. **Arnold's farm** on the northeast bank, four-fifths of a mile around the bend from Irwin's Point, is marked by two small sheds at the water's edge. A few hundred yards beyond these, a drainage ditch enters from the east 50 bank of the river.

*United States charts 43, 42.*

The stream, between banks, maintains an average width of 200 feet ( $61^m0$ ) until Baldoon or Seagel Bend is reached, where it turns sharply from an easterly to a southerly direction, and at the bend it broadens out to 450 feet ( $137^m2$ ) between the banks and 250 feet ( $76^m2$ ) between the 20-foot ( $6^m1$ ) contours. A frame house stands on the northeastern bank and an old wreck lies in the shoal water close to the shore nearby.

From Baldoon Bend to the junction or mouth of Sydenham River, known as **The Forks**, Chenal Ecarte has mid-channel depths of 18 feet ( $5^m5$ ) and over. A drainage ditch enters from the north bank, just west of The Forks, 10 and at its outlet stands the Sutherland pumphouse.

**Current.**—The direction of the current in Chenal Ecarte is southward from St. Clair River to Lake St. Clair, it being joined at The Forks by that of Sydenham River flowing westward and southward to the lake.

**Ferries.—Caution.**—There are three cable ferries on Chenal Ecarte, 15 between St. Clair River and Sydenham River. The most northerly one is located about one-half mile eastward of the Walpole Island leading lights. A second one is operated approximately one mile westward of Johnston Point. The third ferry crosses the river one mile northwestward of the mouth of the Sydenham River. Care should be exercised by boats, when in the vicinity of these ferries, as the cables are suspended at a height of only 3 to 4 feet ( $0^m9$  to 20  $1^m2$ ) above the water.

**Sydenham River** from its mouth, at The Forks, to Wallaceburg, where it is divided into two branches, is  $3\frac{1}{4}$  statute miles in length, and has mid-channel depths ranging from 18 to 25 feet ( $5^m5$  to  $7^m6$ ). The width is an almost 25 constant 200 feet ( $61^m0$ ).

Its direction from Devil's Elbow Bend and the junction with Chenal Ecarte is northeastward to Wallaceburg, with a gentle S-curve forming about three-quarters of a mile below the Chesapeake and Ohio Railway bridge and extending to this bridge.

The Dominion Sugar Company's slip, about one-half mile below the railway bridge, has a depth of 18 feet ( $5^m5$ ) in it. A wharf, located 400 feet (121 $m9$ ) above the slip, has a frontage along the east bank at the sugar company's plant of 400 feet (121 $m9$ ), with depths of 13 to 15 feet ( $4^m0$  to  $4^m6$ ) alongside. Just above this wharf, scows and tugboats moor right alongside the 35 riverbank in 7 or 8 feet ( $2^m1$  or  $2^m4$ ) of water.

Just below the bridge and on the southeast bank is a small wharf of the Canadian Fertilizer Company, with about 15 feet ( $4^m6$ ) of water alongside. Opposite to it, on the northwest bank, is the plant of the Dominion Glass Company.

The Chesapeake and Ohio Railway bridge is a swing bridge, with about a 50-foot ( $15^m2$ ) width between the channel piers. Wallaceburg highway bridge, at Dunoon Street, is 3,100 feet (944 $m9$ ) above the railway bridge. Another highway bridge crosses the North Sydenham River at the end of James Street, just above the Library Park.

**Wallaceburg** is an industrial town, with a population of 7,892 in 1956. The distance from St. Clair River by Chenal Ecarte and Sydenham River is  $12\frac{1}{2}$  statute miles; from Lake St. Clair at Martin Island, by that branch of Chenal Ecarte and the Sydenham River, the distance is  $12\frac{1}{4}$  miles.

## United States charts 43, 42.

**Wharves.**—There is a government wharf at Wallaceburg, with a face 243 feet (74<sup>m</sup>1) in length, and a warehouse 220 feet (48<sup>m</sup>8) by 40 feet (12<sup>m</sup>2), situated on the south bank, immediately above the Wallaceburg bridge, with a depth of 20 feet (6<sup>m</sup>1) at its face. There is an automobile landing ramp at the east end of the wharf. Other wharves are the Canada and Dominion Sugar Company and the Town wharf. The approach to the wharf of the Dominion Sugar Company and the berth at the wharf, but not within 15 feet (4<sup>m</sup>6) of the face, are dredged to a depth of 18 feet (5<sup>m</sup>5).

**Directions.**—Vessel masters need only follow the left bank in descending Chenal Ecarte and ascending Sydenham River, to avoid entering the channels that lead southward to Lake St. Clair Flats. There are no aids, lights or buoys, except at the entrances, as already described. On the other hand, there are no shoals to be encountered, the channel is straight and of fairly uniform depth and width and permits of 16-foot (4<sup>m</sup>9) navigation throughout.

**St. Clair River.—Light.**—A light is exhibited, at an elevation of 31 feet (9<sup>m</sup>4), from a skeleton tower with a white, rectangular daymark on **Willow Point**, on the west bank, about one-third of a mile above the entrance to Chenal Ecarte.

**Port Lambton**, (*Lat. 42° 39' N. Long. 82° 30' W.*) a village on the St. Clair River, 1 $\frac{1}{4}$  miles above Chenal Ecarte, is a station on the Chesapeake and Ohio Railway. There are several small wharves and a small boat basin on the river face.

On the United States shore, opposite to Port Lambton, is **Roberts Landing**, to which there is passenger and vehicular ferry service.

**Channel.**—On the United States side of the river, from about 2,000 feet (609<sup>m</sup>6) above to 4,000 feet (1,219<sup>m</sup>2) below Roberts Landing, a shoal bank which formerly extended to a distance of 800 feet (243<sup>m</sup>8) from the shore has been dredged to a depth of 25 feet (7<sup>m</sup>6) in order to straighten the downbound channel at this locality.

**Light-buoy.**—The northerly end of the above shoal is marked by a black buoy, showing a *flashing white* light, which marks the outside turn of the dredged channel limits.

The west side of the shoal opposite Salt Dock light has been dredged so that the channel, with a depth of 25 feet (7<sup>m</sup>6), has a width of 1,000 feet (304<sup>m</sup>8).

**Light.**—A light is exhibited, at an elevation of 20 feet (6<sup>m</sup>1), from a white, skeleton tower on the Salt Dock, situated on the west bank of the river about 2 miles above Port Lambton.

**Shoal.—Buoys.**—A shoal, with 18 feet (5<sup>m</sup>5) of water on it, lies in mid-stream bearing 139°, distant 1,650 feet (502<sup>m</sup>9) from Salt Dock light.

A red light-buoy, showing a *flashing red* light, is moored northward of this danger, and a red and black horizontally-striped buoy marks the southerly end.

**Woodtick Island** is five-eighths of a mile long, northeast and southwest, about 400 yards (365<sup>m</sup>8) wide at the widest part, near the middle, and lies to the eastward of the main ship channel. Shoal water extends about 800 yards (731<sup>m</sup>5) from the northern end and 650 yards (594<sup>m</sup>4) from the southern end.

*United States charts 43, 42.*

**Buoy.**—A red and black horizontally-striped buoy, moored in 20 feet (6<sup>m</sup>1) of water, marks the end of the shoal extending southward from Woodtick Island.

**Caution.**—A submarine power cable is laid from the eastern side of Woodtick Island to the Canadian shore. Mariners should not anchor in this vicinity. 5

*United States chart 43.*

**Shoal.**—A middle-ground shoal, a mile long with 12 feet (3<sup>m</sup>7) least water on it, lies with its middle point 3,300 feet (1,005<sup>m</sup>8) above the north end 10 of Woodtick Island.

**Marine City**, on the United States shore, is a port opposite to Sombra (just above Woodtick Island). It has a number of wharves. A small stream, **Belle River**, flows through the town into the St. Clair. There are from 8 to 10 feet (2<sup>m</sup>4 to 3<sup>m</sup>0) in Belle River for a certain distance and this stream is 15 used as a winter harbour.

**St. Clair** is a river port on the United States shore opposite to Court-right (see below) and considerably larger than the latter place. It has a number of wharves. The small stream, **Pine River**, flows through the town into the St. Clair. 20

**Channels.**—The main ship channel passing to the westward of Woodtick Island and the middle-ground, has a width of not less than 1,000 feet (304<sup>m</sup>8), with a depth of 25 feet (7<sup>m</sup>6).

The channel passing to the eastward of Woodtick Island and the middle-ground, has a width of not less than 300 feet (91<sup>m</sup>4) with deep water, but 25 is slightly winding and, unmarked, is less frequently used.

**Buoys.**—A red light-buoy, showing a *flashing red* light, is moored in 20 feet (6<sup>m</sup>1) of water on the west edge of the middle-ground a little below the middle. A red and black horizontally-striped conical buoy, fitted with a radar reflector, is moored in 20 feet (6<sup>m</sup>1) of water at the upper end of the 30 middle-ground.

**Sombra**, a small village on the east channel, is a station on the Chesapeake and Ohio Railway. It has a public wharf, with headblock about 300 feet (91<sup>m</sup>4) long by 145 feet (44<sup>m</sup>2) wide, extending about 230 feet (71<sup>m</sup>9) from shore to a depth of 16 feet (4<sup>m</sup>9) at the outer end. A ferry plies from this 35 wharf to Marine City.

**Stokes Point Wharf.**—**Light.**—At Stokes Point, about 1<sup>3</sup>/<sub>4</sub> miles above Sombra, is a wharf, 120 feet (36<sup>m</sup>6) long, on the river face, by 100 feet (30<sup>m</sup>5) wide connected to the shore by a narrow pier, 120 feet (36<sup>m</sup>6) long. The depth at the face is about 18 feet (5<sup>m</sup>5). 40

A light is exhibited, at an elevation of 30 feet (9<sup>m</sup>1), from a pole near the southeastern end of the wharf.

**Clay Creek.**—**Light.**—About 1<sup>1</sup>/<sub>4</sub> miles above Stokes Point, Clay Creek enters the St. Clair.

A light is exhibited, at an elevation of 30 feet (9<sup>m</sup>1), from a mast with a 45 white daymark, on **Kessel Point**, the northern entrance point of Clay Creek.

## United States chart 43.

**Recors Point.—Lights.—Light-buoy.**—Recors Point is situated on the western shore, about one mile above Clay Creek. A plant and wharf of the Detroit Edison Co. is located here.

5 A light is exhibited from the upper and lower end of the wharf. They are privately maintained.

A light-buoy, showing a *flashing red* light, is moored on the eastern side of the channel, opposite Recors wharf.

**Light.**—A light is exhibited, at an elevation of 26 feet (7<sup>m</sup>9), from a dolphin at **Harts Landing**, about 1 $\frac{1}{2}$  miles above Recors Point.

**Courtright**, a village of 581 inhabitants in 1956, is a station on the Chesapeake and Ohio and New York Central Railways. The latter road maintains a ferry between this place and St. Clair, Mich. There is good water along the wharves, which are mostly in ruins, and depths of 15 to 20 feet (4<sup>m</sup>6 to 6<sup>m</sup>1).

15 **Moore**, a station on the Chesapeake and Ohio Railway, is 1 $\frac{1}{2}$  miles above Courtright. There is a wharf with about 12 feet (3<sup>m</sup>7) of water at the outer end.

**Lights.**—A light is exhibited, at an elevation of 20 feet (6<sup>m</sup>1), from a white, square tower on a dolphin, on the east side of the river about three-quarters of a mile below Courtright.

20 A light is exhibited, at an elevation of 30 feet (9<sup>m</sup>1) from a lantern on a pole, close eastward of the upper end of Moore wharf.

**Middle-ground shoals.**—Two middle-ground shoals, separated by a channel of deep water, extend from a point abreast of the grain elevator below Courtright to Moore. The southern shoal has 14 $\frac{1}{2}$  (4<sup>m</sup>5) least water on it, and 25 the northern shoal has only one foot (0<sup>m</sup>3) of water over it near the southern end.

**Channels.**—There is a channel on each side of these shoals. The Canadian Channel, for upbound traffic, has a depth of 24 (7<sup>m</sup>3) or more feet with a minimum width of about 400 feet (121<sup>m</sup>9). The United States Channel, for 30 downbound traffic, has a minimum width of 900 feet (274<sup>m</sup>3) with a depth of 25 feet (7<sup>m</sup>6) or more. The speed limit for upbound vessels between Courtright and Corunna is not to exceed 8 knots over the ground.

**Buoyage.**—The lower end of the shoal is marked by a red and black horizontally-banded buoy, showing an *interrupted quick-flashing white* light. 35 A red buoy, fitted with a radar reflector, showing a *quick-flashing red* light, is moored on the west side of the shoal at the turn in the channel. A red and black horizontally-banded buoy, showing an *interrupted quick-flashing white* light, marks the upper end of the shoal. A red conical buoy, fitted with a radar reflector, marks the lower end of the northern middle-ground and the Canadian Channel is marked by a black spar buoy and a black light-buoy, showing a *flashing green* light, both moored on the east edge of the shoal. On the United States shore, at the bend one mile above Moore, a black light-buoy, showing a *flashing green* light, is moored in 23 feet (7<sup>m</sup>0) of water.

**Stag Island** (*Lat. 42° 53' N. Long. 82° 28' W.*), lying 8 miles from the 45 mouth of the St. Clair River, is 1 $\frac{1}{4}$  miles long and half a mile wide at the widest place, near the middle. It is Canadian territory. There is ferry service to Corunna, Ontario and Marysville, Michigan. There is a Customs office on Stag Island.

## United States chart 43.

Shoals extend 1,000 yards (914<sup>m</sup>4) from the north point of Stag Island and 1 $\frac{1}{4}$  miles from the south end, with 9 feet (2<sup>m</sup>7) of water on the latter shoal one mile from the island, and 3 feet (0<sup>m</sup>9), 600 yards (548<sup>m</sup>6) nearer shore.

5

**Lights.**—A light is exhibited, at an elevation of 25 feet (7<sup>m</sup>6), from a lantern on a pole on the northeast corner of the wharf on the east side of Stag Island.

A light is exhibited, at an elevation of 20 feet (6<sup>m</sup>1), from a white, square tower, near the southern end of the shoal extending southward from Stag Island. 10

The **Canadian Channel** for upbound traffic, past Stag Island, has a minimum width of 500 feet (152<sup>m</sup>4), with a depth of 21 feet (6<sup>m</sup>4) or more. Upbound vessels passing through St. Clair River should be careful to keep in the centre of the channel east of Stag Island.

**Corunna** is a small village on the Canadian shore east of Stag Island. 15 One and a half miles above Corunna, on the United States shore is the village of Marysville.

**Leading lights.—Corunna.**—The front light is exhibited from a white, square tower on a pile cluster on the foreshore at Corunna; the rear light is exhibited, at an elevation of 50 feet (15<sup>m</sup>2), from a white, square daymark 20 with black and white horizontal bands, 230 feet (70<sup>m</sup>1), 167° from the front light. The lights, in line, lead through the Canadian Channel, between the shoals at the head of Stag Island and the shoals off the mouth of **Talford Creek** on the east side of the channel.

**Light.**—Corunna south light is exhibited, at an elevation of 20 feet (6<sup>m</sup>1), from a lantern on a pile about five-eighths of a mile southward of Corunna rear light. 25

30

**Light-buoy.**—A red and black horizontally-striped light-buoy, showing an *interrupted quick-flashing white* light, is moored, in 24 feet (7<sup>m</sup>3) of water at the upper end of the shoal making off north of Stag Island.

The **United States Channel** for downbound traffic, past Stag Island, has a minimum width of 1,000 feet (304<sup>m</sup>8), with a depth of 25 feet (7<sup>m</sup>6) or more.

**Lights.**—Stag Island upper light is exhibited, at an elevation of 26 feet (7<sup>m</sup>9), from a mast with a white, diamond-shaped daymark on the northeast corner of Marysville seawall. 35

35

Stag Island middle light is exhibited, at an elevation of 16 feet (4<sup>m</sup>9), from a white post on a concrete block on the west bank of the river abreast the middle of Stag Island.

**Buoys.**—The United States Channel is also marked by three buoys located as follows: one red and black horizontal-striped can buoy on the lower end of the shoal, below Stag Island and separating the Canadian and United States Channels; one red conical buoy, distant 3,000 feet (914<sup>m</sup>4) upstream from the above can; and another red conical buoy bearing 056°, distant 550 yards (502<sup>m</sup>9) from Stag Island middle light. 40

**Pipelines.—Overhead power lines.**—Three submarine pipelines cross the river about 1 $\frac{1}{4}$  miles above Stag Island. Northward of the pipelines, an overhead transmission line, with an overhead clearance of 178 feet (54<sup>m</sup>3) crosses the river. 45

## United States chart 43.

**Sarnia**, situated on the St. Clair River near Lake Huron, is a station on the Canadian National and Chesapeake and Ohio Railways. The city has numerous industries, particularly in the oil and chemical line. In 1956, the 5 population was 43,447.

There is a ferry service across the river to Port Huron and it is also served by a railway tunnel and the "Blue Water Bridge".

**Harbour.**—The harbour of Sarnia has several miles of wharves, mostly privately owned. From the foot of George Street, 20 to 30 feet (6<sup>m</sup>1 to 9<sup>m</sup>1) 10 can be carried close to shore in front of and below the Ferry Dock, and continuing down to the Imperial Oil Company dock. A channel, 2,400 feet (731<sup>m</sup>5) long and with a minimum width of 100 feet (30<sup>m</sup>5), leading to the wharves of the Dalton Fuels Company and the Dominion Salt Company, has been dredged to a depth of 20 feet (6<sup>m</sup>1). In front of these wharves is a turning basin, with 15 the same depth, and sufficiently wide to allow a vessel 300 feet (91<sup>m</sup>4) long to turn.

Between the southern end of the Dalton Fuels wharf and the Ferry Dock are winter quarters berths for vessels of the Imperial Oil Co. and several small wharves.

**Elevator.**—Sarnia Elevator has a capacity of 3,000,000 bushels, while an elevator annex has a capacity of 2,750,000 bushels. The elevator lies on the north side of a slip situated northwestward of the Dominion Salt Co. wharf and eastward of **Bay Point**. On the southern side of the slip is a Government 20 wharf, 1,400 feet (426<sup>m</sup>7) long, with two warehouses on it. The least depth in the slip is 23 feet (7<sup>m</sup>0), with 20 feet (6<sup>m</sup>1) at the eastern end.

Northwestward of the elevator slip is a basin, separated from the river by a peninsula extending southwards for about three-quarters of a mile from Point Edward, terminating in Bay Point. The basin is about 1,700 feet (518<sup>m</sup>2) long, 250 feet (76<sup>m</sup>2) wide and has been dredged to a depth of 23 feet (7<sup>m</sup>0).

30 On the west side of the basin is the wharf of the Empire-Hanna Coal Company, 600 feet (182<sup>m</sup>9) long, with a minimum depth of 19 feet (5<sup>m</sup>8) alongside. For winter mooring purposes, dolphins, 100 feet (30<sup>m</sup>5) apart with mooring piles inshore of them, have been placed along the full length of the eastern side of the basin and also on the west side of the basin north of the coal wharf.

35 **Sarnia Yacht Club** lies between the eastern mooring berths in the basin and the elevator wharf.

**Lights.—Buoys.**—A light is exhibited, at an elevation of 17 feet (5<sup>m</sup>2), from a small, steel tower on a dolphin, near the outer end of the south side of the elevator slip.

40 A light is exhibited, at an elevation of 26 feet (7<sup>m</sup>9), from a square, skeleton tower near the southern extremity of Bay Point.

Red spar buoys mark the edge of shoal water in the river channel at Sarnia.

**Port Huron**, opposite to Sarnia, is an important Michigan city with port 45 facilities and considerable shipping. **Black River** flows through the town into the St. Clair.

*United States chart 43.*

**Channels.**—The improvements by the United States has consisted in the removal of an extensive shallow area, which originally obstructed the west side of the river along the lower part of the Port Huron front, from a little above to well below the mouth of Black River, and reaching to or beyond midstream. As a result of this work, the full width of the river has been made available to navigation, with separate routes for upbound and downbound traffic. The United States side of the river, used by downbound traffic, has a depth of 25 feet (7<sup>m</sup>6) over a width of 1,000 feet (304<sup>m</sup>8) or more. The Canadian side, used by upbound traffic, affords depth of 21 feet (6<sup>m</sup>4) or more.

5

10

**Regulations.**—The west channel shall be known as the American Channel and the east channel as the Canadian Channel, and the following traffic rules shall govern on and after July 5, 1921:

Rule 1. All downbound vessels shall navigate the American Channel. All upbound vessels shall navigate the Canadian Channel. Vessels under 100 gross tons and vessels making local stops along these routes are exempt from this rule.

15

Rule 2. The speed of vessels navigating these channels shall not exceed 9 miles per hour.

20

**Light-buoy.**—In midstream, and just above a point opposite the mouth of the Black River, a vertically-striped black and white light-buoy, showing groups of *short-long* white flashes, marks the point of separation for upbound and downbound traffic.

25

**Caution.—Current.**—At the upper end of the west (U.S.) or downbound channel will be found at times a current of 4 miles or more per hour. Masters of vessels are warned to hold well up when turning into the downward channel because of the velocity of flow and the cross currents which tend to carry vessels to the eastward. By reason of the proximity of this channel to Port Huron wharves and shipping, vessel masters should check speed to the lowest safe limit and be careful to avoid damage or hazard to such shipping.

30

**Anchorage.**—The anchorage near the head of St. Clair River, below the rapids and abreast of Sarnia, is good in clay and gravel. Good holding ground and some eddy will be found on the Canadian shore below the Canadian National docks. Vessels should anchor as close to the shore as safety will permit, to leave mid-channel clear for passing vessels.

35

**Point Edward** is at the entrance of the St. Clair River adjoining Sarnia. It is an important shipping terminal of the Canadian National Railways and a port of call for many large Canadian vessels. The Canadian Government maintains a channel about 21 feet (6<sup>m</sup>4) deep along the front of the docks. The locality is subject to continual shoaling, requiring annual dredging for maintenance of the channel. In 1956, the population was 2,558.

40

**Rapids.**—In the narrow section of the river abreast Point Edward the current has a velocity of 5 miles per hour.

**Buoy.**—A red spar buoy is moored off the northwestern edge of the bank, extending northwestward from Bay Point.

45

**Bridge.**—The “Blue Water” highway bridge connects Point Edward with Port Huron. The main portion of the bridge is of the cantilever type, with a main span 875 feet (266<sup>m</sup>7) long and two anchor arms 326 feet (99<sup>m</sup>4) in

*United States chart 43.*

length. The vertical clearance is 150 feet (45<sup>m</sup>7) above high water level for a width of 200 feet (61<sup>m</sup>0) and 135 feet (41<sup>m</sup>1) for a width of 600 feet (182<sup>m</sup>9).

**Lights.**—Four *fixed red* lights mark the channel limits and two *flashing green* lights are located at the centre of the span, on the axis of the Fort Gratiot leading lights; the lights are suspended from the lower chords of the bridge.

**Leading lights.—Fort Gratiot.**—Leading lights are shown at Port Huron, near Fort Gratiot. The front light is exhibited, at an elevation of 42 feet (12<sup>m</sup>8), from a black, skeleton tower with a white, oval daymark. A 10 passing light, visible from 223° through north to 043°, is exhibited, at an elevation of 44 feet (13<sup>m</sup>4) from the same structure. The rear light is exhibited at an elevation of 64 feet (19<sup>m</sup>5), from a skeleton tower with a white, elliptical daymark, 635 feet (193<sup>m</sup>9), 207 $\frac{1}{4}$ ° from the front light. These lights in line lead through the rapids to the intersection of their alignment with the Point 15 Edward leading lights.

**Leading lights.—Point Edward.**—Leading lights are shown at Point Edward at the head of the St. Clair River. The front light is exhibited, at an elevation of 35 feet (10<sup>m</sup>7), from a white, square tower on the beach north of Point Edward; the rear light is exhibited, at an elevation of 120 feet (30<sup>m</sup>6), 20 from a lantern on a yellow diamond-shaped daymark, with a black vertical stripe in the middle, on the eastern approach to the Blue Water Bridge. The lights in line lead in to the head of the St. Clair River from Lake Huron, to their intersection with the Fort Gratiot leading lights.

**Radio station.**—Sarnia radio station is located about 10 $\frac{1}{2}$  miles eastward 25 of Point Edward.

**Light.**—Fort Gratiot light (*Lat. 43° 00' N., Long. 82° 25' W.*) is exhibited, at an elevation of 82 feet (25<sup>m</sup>0), from a white, conical tower on the west shore of Lake Huron, close northward of the entrance to St. Clair River.

**Fog signal and light.**—When there is fog in the river, a fog signal is 30 sounded from a building close northward of the lighthouse and, in addition, a fixed amber light is exhibited, at an elevation of 25 feet (7<sup>m</sup>6), from the same building. The fog light is visible, on a bearing of 004°, towards Lake Huron lightship.

**Directions for the St. Clair River (upbound vessels).**—From the 35 dredged channel in Lake St. Clair, enter South Channel through the St. Clair Flats Canal. On reaching the St. Clair Flats Canal upper light, haul gradually into mid-channel and keep thus, until between the two lights at the junction of South and Bassett Channels.

Thence head on the alignment of Harsens Island lights, steering 023° 40 on this course until within 450 yards (411<sup>m</sup>5) of the front light, when haul gradually to the eastward, keeping to the western side of the channel until Russell Island lights are in line, bearing 042°. Steer on that course until nearly abreast Grande Point light, when proceed in mid-channel until near Woodtick Island. Thence alter course to westward to pass the island and adjacent shoals, if bound for the main channel, which is to the west of the island.

45 The 18-foot (5<sup>m</sup>5) spot just below the red light-buoy, and one mile below Woodtick Island should be avoided.

*United States chart 43.*

If going through the Canadian Channel, alter course to the eastward. There are no aids for this channel and it should not be attempted without local knowledge.

Past Woodtick Island and shoals, keep in mid-channel until near the mid-channel light-buoy below the towns of Courtright and St. Clair, when alter course to the eastward to clear the middle-ground and proceed through the upbound (Canadian) channel. When clear of the middle-ground marked by two buoys, proceed in mid-channel until near Stag Island when change course to eastward. Entering the Canadian Channel, the one for upbound traffic, proceed in mid-channel until the alignment of Corunna lights is astern; with these in line astern, bearing  $167^{\circ}$ , proceed through the upper part of the Canadian Channel until clear of Stag Island shoals. Keep to mid-channel until near the mouth of Black River, when alter course to pass on the Canadian side of the light-buoy in midstream, marking the point of separation of upbound and downbound traffic. Thence swing westward to pass close to the west of Bay Point light, and proceed until on the line of Fort Gratiot leading lights, when steer  $027^{\circ}$  through the rapids. Hold this course until Point Edward leading lights are in line astern, bearing  $180^{\circ}$ , then steer  $360^{\circ}$  into Lake Huron.

**Directions for downbound vessels**—When the Fort Gratiot leading lights come in line, leave the Point Edward leading line, and follow the former until about one-quarter mile above the front light. Then keep to mid-channel or slightly west of it, until abreast Stag Island upper light, about 7 miles down-river. Pass between the light, and Stag Island upper light-buoy, and keeping the same distance off the United States shore, proceed thus about  $4\frac{1}{2}$  miles. A vessel should now be near the St. Clair middle-ground, and must pass to westward of the three light-buoys marking the west edge of these shoals. Keep the same distance off the west bank of the river, until near Russell Island, at the head of the St. Clair delta. Put the horizontally-striped light-buoy to starboard and keep in mid-channel, until the Russell Island leading lights are in line astern, proceeding on their alignment,  $222^{\circ}$  about  $1\frac{3}{4}$  miles. Thence keep in mid-channel until Harsens Island lights are in line astern. Proceed thus,  $203^{\circ}$ , until near the head of Bassett Channel, when turn westward and steer a middle course through "Southeast Bend" Channel to St. Clair Flats Canal.

**Note.**—If bound up Lake Huron, consult "Great Lakes Pilot, Vol. II." 35



## INDEX

NOTE.—Names in brackets indicate either the general locality or neighbouring prominent feature.

	PAGE		PAGE
	<b>A</b>		
Abino, Point.....	118	Bear Point.....	10
Light, Fog signal.....	118	Buoy.....	10
Adolphus Reach.....	32	Bearings.....	iv
Adolphustown.....	32	Becroft Clump.....	57
Advertisement.....	ii	Becroft Point.....	57
Algonac.....	175	Bedford Creek.....	13
Allan Otty Shoal.....	11	Bell Point (Wolfe Island).....	10
Light-buoy.....	11	Belle Isle.....	162
Allanburg.....	105	Bridge.....	162
Allison Wharf.....	33	Buoys.....	162
Light.....	33	Coast Guard Station.....	162
Alma, Port.....	139	Lights.....	162
Caution.....	139	Belle Point.....	146
Ambassador Bridge.....	157	Belle River (Lake St. Clair).....	168
Amherst Bar.....	7	Belle River (St. Clair River).....	176
Amherst Island.....	7	Bellefontaine.....	40
Amherstburg.....	152	Bridge.....	41
Wharves.....	152	Buoys.....	40
Amherstburg Channel.....	151, 153	Cables.....	41
Amherstburg Reach.....	153	Directions.....	41
Anchorage.....	153	Lights.....	41
Leading lights.....	153	Wharves.....	40
Anchor Bay.....	171	Berdans Shoal.....	8
Anderson Wharf.....	42	Big Bar Shoal.....	9
Anderson Shoal.....	42	Big Bay.....	39
Buoy.....	42	Big Chicken Island.....	144
Anglin Bay.....	3	Big Creek (Lake Erie).....	148
Buoy.....	3	Big Gap.....	32
Anne Point.....	40	Big Island.....	39
Armenia, wreck.....	148	Big Island Shoal.....	39
Light-buoy.....	148	Big Muscamoot Bay.....	173
Arnold's Farm.....	176	Big Otter Creek.....	134
Ashbridge Bay.....	68	Big Sandy Bay.....	10
Yacht Club.....	68	Bigelow Island.....	57
Askins Point.....	168	Bird Island Reef.....	113
Athol Bay.....	53	Buoys.....	113
Anchorage.....	53	Black River.....	182
		Light-buoy.....	183
	<b>B</b>	Black River Bay.....	13
Baby Point.....	176	Black Rock Canal.....	117
Bagnall Point.....	170	Blue Water Bridge.....	183
Baird Point.....	11	Lights.....	184
Baker Island.....	43	Bluff Bar.....	133
Bald Head Island.....	57	Buoys.....	133
Bald Island.....	57	Bluff Point (Amherst Island).....	7, 8
Baldoon (Scagel) Bend.....	176	Bluff Point (Lake Erie).....	132
Ballards Reef.....	153	Bogart Wharf.....	35
Ballards Reef Channel.....	153	Buoy.....	35
Leading lights.....	153	Bois Blanc Island.....	154
Balmy Beach.....	68	Caution-cable.....	154
Balsam, Lake.....	46	Light.....	154
Baltimore Channel.....	175	Bond Head.....	64
Baptiste Creek.....	169	Bongard.....	32
Bar Point Shoal.....	153	Bouchette Point.....	64
Light-and-bell-buoy.....	152	Boundary—Lake Ontario and St. Lawrence River.....	1
Barcovan Beach.....	57	Bowmanville.....	64
Barriefield Common.....	4	Bradleys.....	169
Leading lights.....	4	Brighton.....	56
Barry Point.....	8	Brock Monument.....	88
Bass Cove.....	34	Bronte.....	78
Bass Island (Bay of Quinte).....	32	Harbour.....	78
Bass Island (Henderson Bay).....	13	Light.....	78
Bass Islands (Lake Erie).....	144	Bronte Creek.....	78
Bassett Channel.....	173	Brother Islands.....	7
Depths.....	173	Bruce, Port.....	135
Light.....	174	Light.....	135
Beateau Channel.....	9	Buckley Point.....	34
Bath.....	7	Buffalo Harbour.....	114
Bay Centre.....	35	Black Rock Canal.....	117
Bay Point.....	182	Buoys.....	115
Buoy.....	183	Dry docks and shipyard.....	116
Light.....	182	Gauge, water.....	117
Bay of Quinte.....	32	Lackawanna Canal.....	116
Caution, buoys.....	32	Lights, fog signals.....	115
Pilotage.....	56	Radiobeacons.....	115
		South entrance.....	115

PAGE	PAGE		
Buffalo Harbour— <i>Continued</i>			
Storm signals, lifeboat.....	115	Chenal Ecarte.....	176
Union Canal.....	116	Buoy.....	176
Wharves.....	116	Current.....	177
Bull Rock Point.....	12	Depth.....	176
Buoyage and Signal Systems.....	xix	Directions.....	178
Buoys.....	xiii	Ferries—caution.....	177
Burlington.....	78	Leading lights.....	176
Burlington Canal.....	79	Wharf.....	176
Bridges.....	81	Cherry Island.....	12
Bridge signals.....	80	Light.....	12
Danger area.....	85	Chick Island.....	144
Lights, Fog signal.....	80	Chickenolee Reef.....	143
Light-buoy.....	81	Chimney Point.....	34
Radio beacon.....	80	Light.....	34
Burwell, Port.....	134	Chippawa.....	111
Depths.....	134	Chippawa Channel.....	112
Ice.....	134	Chippawa Creek.....	102
Lights, Fog signals.....	134	Chub Point.....	61
Radio station.....	134	Clark Island.....	35
		Clarkson Harbour.....	77
		Lights, Fog signal.....	77
		Wharves.....	77
	<b>C</b>	Clay Creek.....	179
Calf Island.....	14	Clear Creek.....	133
Calf Island Spit.....	14	Clearville.....	137
Buoy.....	14	Clemens, Mount.....	171
Camel Shoal.....	60	Clinton River.....	171
Campbell Point.....	13	Coatsworth Cut.....	68
Canada Cement Wharf (Big Bay).....	39	Cobourg.....	61
Buoys.....	39	Harbour.....	61
Canada Club Wharf.....	173	Lights, Fog signal.....	62
Canards, Rivière aux.....		Colborne.....	60
Cape Vincent Harbour.....	155	Colborne, Port.....	124, 108
Cables.....	1	Administration Building.....	107
Lights.....	1	Buoys.....	108
Regulations.....	1	Harbour.....	108
Carmel, Mount.....	36	Lights, Fog signals.....	109
Carman Shoal.....	36	Radio beacon.....	109
Buoy.....	36	Radio-telephone.....	104, 109
Carruthers Point.....	6	Colchester.....	147
Leading lights.....	6	Colchester Reef.....	147
Carruthers Shoal.....	4	Buoys.....	148
Buoy.....	5	Light.....	147
Carrying Place.....	57	Cole Point.....	32
Casey Point.....	35	Cole Wharf.....	36
Buoy.....	35	Ferry.....	36
Catalaque Shoal.....	36	Collier Shoal.....	60
Light-buoy.....	36	Clearing Mark.....	60
Cataraqui Bay.....	5	Collins Bay.....	6
Breakwater.....	5	Buoys.....	6
Buoyage.....	6	Compass, Change in variation of.....	xvii
Elevators.....	5	Connor Bay.....	125
Intake pipes.....	6	Connors Island.....	111
Cataraqui River.....	3	Consecon.....	57
Catfish Creek.....		Contents.....	iii
Cedar Beach.....	135	Conversion Table, Fathoms to metres.....	v
Light.....	147	Feet to metres.....	vi
Cedar Creek.....	147	Coots Paradise.....	83
Cedar Island.....	40	Corunna.....	181
Cedar Springs.....	139	Leading lights.....	181
Celeron Island.....	152	Lights.....	181
Centre Brother Island.....	7	Courttright.....	180
Light.....	8	Buoyage.....	180
Charity Shoal.....	10	Channels.....	180
Abnormal variation.....	11	Cow Island.....	40
Buoy.....	10	Credit, Port.....	76
Charles B. Packard, wreck.....	148	Buoys.....	76
Chart, Accuracy of.....	xii	Lights.....	76
Charts, Index map of.....	1	Wharf.....	76
Charts, Notes concerning.....	xi	Credit River.....	76
The use of.....	xii	Crowland.....	106
Charter Island.....	35	Crysler Point.....	63
Charwell Point.....	52	Crystal Beach.....	118
Chatham.....	170	Wharf.....	118
Chatterton Point.....	59		
Chaumont Bay.....	12		
Chaumont River.....	12	Dablon Point.....	11
Chaumont Village.....	12	Anchorage.....	11
Chematogan Channel.....			
Chenal à Bout Rond.....			

PAGE	PAGE		
Dalhousie, Port.....	85	Dover, Port.....	129
Buoy.....	86	Buoys.....	129, 130
Dry dock.....	86	Lights, Fog signal.....	129, 130
Lights, Fog signal.....	86	Marine railways.....	129
Rifle range.....	86	Dry Docks:	
Danger area:		Buffalo.....	116
Burlington Channel—Grimsby.....	85	Ecorse-Wyandotte.....	158
Frenchman Bay.....	67	Kingston.....	4
Mimico.....	76	Port Dalhousie.....	86
Oshawa.....	65	Port Weller.....	102
Point Petre.....	52	Duckling Reef.....	16
Preston Reef.....	52	Duffin Creek.....	67
Spencer Point.....	59	Dundas.....	83
Dark Bend.....	176	Dundas Marsh.....	83
Darlington, Port.....	64	Dunville.....	125
Buoy.....	64	Dutch John Bay.....	14
Datum:			
Detroit River.....	iv		<b>E</b>
Lake Erie.....	iv		
Lake Ontario.....	iv	East Charity Shoal.....	11
Lake St. Clair.....	iv	Bell-buoy.....	11
Niagara River.....	iv	Caution.....	11
River St. Clair.....	iv	Light.....	11
Depths.....		East Shoal.....	140
Deseronto.....	37	East Sister Island.....	145
Wharf.....	37	East Sister Shoal.....	145
Desjardins Canal:		East Windsor.....	150
Bridges.....	83	Eastern Gap.....	70
Detroit:		Beacon.....	70
Buoy.....	162	Lights, Fog signal.....	70
Shoal.....	163	Ecorse.....	157
Detroit River:		Dry dock.....	158
Buoys—caution.....	162	Ecorse River.....	157
Channels.....	152	Edward, Point.....	183
Datum.....	iv	Leading lights.....	184
Depths.....	149	Radio station.....	184
Detroit River light, fog signal, radio-beacon.....	162	Rapids.....	183
Directions—upbound.....	163	Eightmile Creek.....	87
Directions—downbound.....	164	Elba Island.....	152
Fluctuations of water surface.....	149	Elliot Point.....	153
General description.....	149	Leading lights.....	153
Ice.....	165	Emerald.....	8
Rules and regulations for Lower Detroit River.....	159	Ferry.....	8
Regulations for passing and tow lines.....	150	Emeric Point.....	8
Season of navigation.....	159	Erie Canal.....	111
Small craft warning.....	150	Dimensions.....	111
Upper Detroit River.....	155	Locks.....	111
Water level gauge.....	151	Erie, Lake.....	119
Devil's Elbow Bend.....	176	Datum.....	119
Dexter.....	13	Dimensions, elevations.....	119
Dickinson Island.....	175	Harbours.....	120
Direction finders, Calibration of.....	xx	Lake levels.....	120
Interference.....	xxi	Maximum and minimum water surface elevations.....	123
Directions:		Season of navigation.....	121
Belleville to Trenton and Murray Canal.....	46	Water surface elevations.....	122
Deseronto to Belleville.....	41	Erieau.....	138
Kingston to Lake Ontario.....	17	Evans Point.....	127
Lake Ontario to Bay of Quinte.....	20	Everett Point.....	6
Lake Ontario to Kingston.....	18		
Lake Ontario to Tibbets Point.....	18		
Pleasant Point to Deseronto and Napancee.....	37		
Tibbets Point to Lake Ontario.....	18		
Distance objects may be seen at sea.....	vii		
Distances between points on:			
Lake Erie and St. Clair, Detroit and Niagara Rivers.....	x	False Ducks Bank.....	16
Distances between points on:		Buoys.....	16
Lake Ontario and St. Lawrence River.....	ix	False Ducks Islands.....	16
Distances between points on:		Anchorage.....	16
Great Lakes.....	xviii	Fathom lines, caution.....	xii
Distance of an object by two bearings and distance run between them.....	xvi	Fathoms to meters, conversion table.....	v
Distances.....	iv	Feet to metres, conversion table.....	vi
Dobbs Bank.....	57	Ferry Point.....	33
Don River.....	73	Ferry.....	33
Downey Wharf.....	7	Fiftymile Point.....	84
		Fighting Island.....	155
		Buoy, light.....	155
		Shoal.....	155
		Fighting Island Channel.....	154
		Alternative channel.....	156
		Anchorage—buoys.....	154





PAGE	PAGE
Maybury Highway Light.....	79
McFaul Shoal.....	171
McNab Crossroads.....	137
Melville Shoal.....	64
Buoy.....	64
Middle Channel (St. Clair River).....	175
Light-buoy.....	175
Middle Island.....	144
Middle Point.....	143
Middle Reef.....	113
Buoys.....	113
Middle Sister Island.....	145
Light.....	145
Middle Ground (Lake Ontario).....	9
Clearing mark.....	9
Light-and-bell-buoy.....	9
Middle Ground Shoal (Pelee Passage).....	141
Buoys.....	141
Milford, Port.....	19
Mill Point.....	143
Miller Bay.....	127
Miller Point.....	127
Millhaven.....	7
Ferry.....	7
Millhaven Creek.....	7
Mimico.....	75
Danger area.....	75
Minnie Blakely Shoal.....	40
Buoys.....	40
Mitchell Bay.....	170
Mitchell Bay Village.....	170
Buoyage.....	170
Leading lights.....	170
Wharf.....	170
Mitchell Point.....	170
Mohawk Bay.....	125
Mohawk Church Light.....	38
Mohawk Island.....	125
Light.....	125
Mohawk Point.....	124
Moira River.....	40
Moira Shoal.....	55
Moore.....	180
Lights.....	180
Moore Point.....	67
Morgans Point.....	124
Morpeth.....	137
Morpeth Pier.....	137
Mosquito Bay.....	143
Mosquito Point.....	142
Moulton Bay.....	125
Anchorage.....	125
Caution.....	125
Mount Carmel.....	36
Mount Clemens.....	171
Mount Nemo.....	79
Mud Bay.....	11
Mud Creek.....	11
Mud Island.....	157
Mulcaster Patch.....	60
Mulcaster Point.....	60
Murray Canal.....	44
Bridges.....	44
Buoy.....	44
Lights.....	44
Muscote Bay.....	39
Myers Point.....	43
Myles Shoal.....	6
Buoy.....	6
N	
Nanticoke Creek.....	199
Leading lights.....	129
Nanticoke Shoal.....	129
Napanee.....	37
Wharves.....	37
Napanee River.....	37
Navy Point.....	13
Nemo, Mount.....	171
New Baltimore.....	137
New Glasgow.....	64
Newcastle.....	64
Harbour.....	64
Niagara Falls, N.Y.....	89
Niagara Bar.....	89
Buoys.....	89
Clearing marks.....	89
Niagara-on-the-Lake.....	111
Lights, Fog signal.....	87
Rifle ranges.....	87
Wharf.....	87
Niagara River.....	88, 90
Currents.....	113
Directions.....	90, 113
International Bridge, signals.....	112
Lights, Fog signal.....	112
Peace Bridge.....	113
Suspension Bridge.....	90
Nicholson Island.....	54
Nigger Island.....	42
Light.....	43
Nigger Narrows.....	43
Buoys.....	43
Ninemile Point.....	9
Light, Fog signal.....	9
Nipigon Cut.....	174
Normandale.....	130
North Bay (Pelee Island).....	141
North Channel (Bay of Quinte).....	7
Ferry.....	8
Telegraph cable.....	8
North Channel (St. Clair River Delta).....	175
Light-buoy.....	175
North Harbour Island.....	145
North Harbour Island Reef.....	145
Light-buoy.....	145
North Pond.....	15
North Wharf (Scudder Dock).....	142
Light.....	142
Warning-cables.....	142
Northport Shoal.....	38
Buoys.....	38
Northport Village.....	38
Notes concerning charts, lists of lights, sailing directions, etc.....	xi
Nut Island.....	8
●	
Oakville.....	77
Buoys.....	78
Harbour.....	77
Light.....	78
Oakville Creek.....	77
Ogden Point.....	60
Oil, Use of.....	xvii
Ojibway.....	156
Old Welland Canal Feeder.....	126
Old West Channel.....	173
Onderdonk Point.....	43
Buoys.....	44
Ontario, Lake.....	xxiv
Datum.....	iv, xxiv
Dimensions, Elevations, etc.....	xxiv
General notes.....	xxvi
Harbours.....	xxvi
Ice.....	xxvi
Season of navigation.....	xxvi
Variation of compass.....	xxvi
Water surface elevations.....	xxv
Oshawa.....	65
Buoys.....	65
Danger area.....	65
Harbour.....	65
Lights.....	65
Ottawa River Route.....	24
Otty Point.....	63

PAGE	PAGE		
Ouvry.....	139	Presqu'ile Bay—Continued	56
Owen Point.....	53	Directions.....	55
Ox Point.....	40	Leading lights.....	55
Oxley.....	147	Middle Ground.....	55
<b>P</b>			
Paine Court Dock.....	170	Pilotage.....	56
Palen Bank.....	54	Presqu'ile Point.....	55
Parrot Bay.....	7	Light.....	55
Intake pipe—buoys.....	7	Preston Cove.....	8
Light.....	7	Preston Reef.....	52
Wharf.....	7	Danger area.....	52
Parrot Point.....	7	Prince Edward Bay.....	19
Light-buoy.....	7	Prince Edward Point.....	16
Pascall P. Pratt, wreck.....	132	Buoys.....	16
Patrick Point.....	137	Light.....	16
Peace Bridge (Niagara River).....	113	Prinyer Cove.....	32
Peach Island.....	163	Proctor Point.....	59
Leading lights.....	167	Psyche Shoal.....	17
Light.....	163	Caution.....	17
Light—buoy.....	163	Light-and-bell-buoy.....	17
Peacock Point.....	128	Puce Village.....	168
Shoal.....	128	Puces, Rivière aux.....	168
Pele Island.....	141	Pull Point.....	33
Pele Passage.....	140	<b>Q</b>	
Light, Fog signal.....	140	Queenston.....	90
Pele Point.....	140	Quick Shoal.....	57
Anchorage.....	145	Quinte, Bay of.....	32
Buoy.....	140	Caution-buoys.....	32
Light, Fog signal.....	140	Pilotage.....	56
Radio beacon.....	140	<b>R</b>	
Wrecks.....	140	Raby Head.....	65
Peninsula, Point.....	11	Radio Aids to Navigation.....	xx
Light-buoy.....	12	Radio beacons.....	xx
Penitentiary Shoal.....	6	Radio beacons, Calibration of.....	xx
Light-buoy.....	6	Charts.....	xxi
Perch Cove.....	34	Radio, Coast Stations.....	xx
Peter Rock.....	62	Rameys Bend.....	106
Light.....	62	Rattlesnake Point.....	79
Peterson Wharf.....	38	Recors Point.....	180
Buoy.....	38	Light.....	180
Ferry.....	38	Light-buoy.....	180
Petre, Point.....	52	Wharf.....	180
Danger area.....	52	Redhill Creek.....	84
Light, Fog signal.....	52	Rednerville Wharf.....	42
Pickering Beach.....	67	Reed Bay.....	10
Picton.....	34	Regulations for:	
Wharves.....	34	Oil tankers etc.....	xxiii
Picton Bay.....	33	Operating swing span of bridges.....	xxiii
Buoys.....	34	Richardson Point.....	67
Pig Point.....	8	Ryerse, Port.....	130
Light.....	8	Rideau Canal.....	4, 21
Pigeon Bay.....	147	Mileage and general data.....	22
Pigeon Island.....	10	Rules and regulations.....	25
Light.....	10	Rideau River.....	21
Pike Creek.....	168	Riverside.....	163
Pillar Point.....	12	River—See proper name.....	
Pine Point.....	57	Roberts Landing.....	178
Pine River.....	179	Buoys.....	178
Pins, Pointe aux.....	137	Channel.....	178
Light.....	138	Light.....	178
Pleasant Point.....	7, 32	Robinson, Port.....	105
Basin.....	7	Roblin Mills.....	36
Light.....	7	Rock Island.....	124
Plum Point.....	137	Rockhouse Point.....	125
Point—See proper name.....		Romney.....	139
Popham Bay.....	59	Rond, Chenal à Bout.....	175
Anchorage.....	60	Rondeau.....	138
Position, Fixing.....	xiv	Rondeau Bay.....	139
Potter Point.....	42	Rondeau Harbour.....	138
Pottahawk Point.....	130	Channels.....	138
Shoal.....	130	Current.....	138
Prairie Siding.....	170	Lights, Fog signal.....	138
Precise Water levels Records.....	xxviii, 121	Rondeau National Park.....	139
Presqu'ile Bay.....	55	Roses Reef.....	118
Anchorage.....	56	Ross Point.....	66
Buoyage.....	55	Rossmore.....	41
Caution.....	55		

	PAGE		PAGE
Rosgell Farm	169	Sarnia	182
Rouge River (Detroit)	163	Anchorage	183
Canal	163	Bridge	183
Light-buoy	163	Buoys	182
Rouge River (Lake Ontario)	67	Caution—current	183
Rowan, Port	131	Harbour	182
Buoys	131	Lights	182
Lights	131	Wharves	182
Wharf	131	Sawguin Island	39
Rumsey Shoal	89	Scarborough Bluffs	68
Ruscom River	168	Schlosser Channel	111
Rush Bar	40	Scotch Bonnet Island	54
Light-buoy	40	Light	54
Russell Island	174	Scotch Bonnet Shoal	54
Leading lights	174	Scott Middle Ground	162
Light	174	Buoys	162
Russell Island Shoal	174	Seugog Branch	47
Channel	175	Second Channel	171
Light-buoy	175	Leading lights	171
		Seiches	xxvii
		Seneca Shoal	117
		Light-buoy	117
		Shannondale	39
		Sheridan Point	142
		Sherkston	118
		Ship Island	39
		Ship Islet	40
		Shisley Point	118
		Shoal Point	55
		Signal Systems	xx
		Silver Creek	134
		Simcoe Island	9
		Wharf	9
		Six Town Point	14
		Smoke Point	57
		Snake Island (Kingston)	9
		Bank	9
		Buoys	9
		Snake Island (Ox Point)	40
		Snowshoe Bay	14
		Sombra	179
		Soundings	iv
		Soup Harbour	53
		South Bay (Pelee Island)	143
		South Bay (Prince Edward Point)	19
		South Channel (St. Clair Flats)	172
		South Channel (St. Lawrence River)	2
		South Charity Shoal	11
		Southeast Bend	172
		Lights	173
		Southeast Shoal	140
		Light, Fog signal	140
		Light-and-bell-buoy	140
		Radio beacon	140
		Specular, wreck	140
		Spence, Lake	53
		Spencer Point	59
		Danger area	59
		Splatt Bay	125
		Squirrel Island	174
		Light	174
		Stag Island	180
		Buoys	181
		Channel	181
		Lights	181
		Staley Point	10
		Stanley, Port	135
		Bridge	135
		Depths	136
		Lights, Fog signal	136
		Stella	8
		Stella Bay	8
		Stokes Point Wharf	179
		Light	179
		Stoneburg Cove	57
		Stony Creek (Lake Erie)	128
		Stony Creek (Lake Ontario)	84
		Stony Island (Lake Ontario)	14
		Light-buoy	14
		Stony Island (Detroit River)	152

## S

NOTE:—All names prefixed by Saint or Sainte will be found indexed in alphabetical order after the letter S.

	PAGE		PAGE
Stony Point (Henderson Bay).....	14	Trenton Channel.....	158
Light.....	14	Trident Point.....	39
Stony Point (Lake St. Clair).....	169	Buoys.....	39
Stony Point Village.....	169	Trumper Point.....	35
Storm Signals.....	xxi	Buoys.....	35
Storm Signal Stations.....	xxii, xxiii	Turkey Island.....	33, 35
Storrs Point.....	13	Turkey Point.....	155
Strawberry Island.....	112	Wharf.....	130
Sturgeon Creek.....	145	Twelve-foot Shoal.....	130
Sugar Island.....	152	Twelve O'Clock Point.....	113
Sugar Point.....	57	Twenty-mile Creek.....	44
Sugar Loaf Hill.....	124	Twomile Creek.....	85
Sugar Loaf Point.....	124	Tyrconnel.....	87
Suspension Bridge (Niagara River).....	90		137
Swetman Island.....	16		
Light, Fog signal.....	16		
Sydenham River.....	177		
Bridges.....	177		
Directions.....	178		
			U
<b>T</b>			
Talbot Creek.....	137	Unger Island.....	37
Talbot, Port.....	137	Union Canal (Buffalo).....	116
Talford Creek.....	181	Bridge.....	116
Tay Branch (Rideau Canal).....	21	Union, Port.....	68
Tecumseh.....	168	United States:	
Tecumseh Reef.....	127	Radio Beacons.....	xx
Telegraph Island.....	38	Storm signal stations.....	xxii
Light.....	38	Upper Gap.....	7, 20
Telegraph Narrows.....	38	Buoys.....	20
Buoys.....	38		
Light.....	38		
Tenmile Creek.....	87		V
Thames River.....	169		
Buoyage.....	169	Variation of Compass.....	iv, xvii
Depths.....	169	Vesey, Cape.....	19
Lights.....	169	Vincent, Cape.....	1
Third Welland Canal.....	107	Cables.....	1
Caution.....	107	Harbour.....	1
Wharf.....	107	Lights.....	1
Thompson Point.....	35	Regulations.....	1
Thorold.....	104		
Three Mile Bay.....	12		W
Tibbetts Point.....	2		
Light, Fog signal.....	2	Walkerville.....	157
Light-buoy.....	3	Wallaceburg.....	177
Radio beacon.....	2	Wharves.....	178
Shoal.....	3	Wallbridge Point.....	40
Timber Island.....	16	Walpole Island.....	175
Anchorage.....	16	Lights.....	175
Tonawanda (American) Channel.....	111	Wharf.....	175
Tonawanda Creek.....	111	Water Surface Elevations (Lake Erie).....	123
Toronto.....	68	Water Surface Elevations (Lake Ontario).....	xxv
Buoyage.....	71	Watercombe Village.....	35
Conspicuous marks.....	68	Waupoos Island.....	19
Depths.....	74	Waupoos Village.....	19
Directions.....	72	Wharves.....	19
Eastern entrance.....	70	Waverly Shoal.....	117
Ferry.....	72	Buoys.....	117
Harbour.....	69	Way Point.....	43
Keating Channel.....	73	Buoy.....	43
Lights, Fog signals.....	70, 71	Welland.....	105
Life-saving stations.....	70	Welland Canal Feeder, Old.....	126
Radio beacon.....	70	Welland Junction.....	106
Repairs.....	74	Welland River.....	111
Western entrance.....	71	Light.....	111
Wharves.....	72	Syphon Cutout.....	102
Yacht clubs.....	72	Welland Ship Canal.....	91, 100
Traverse Shoal.....	16	Administration building (North).....	103
Trent-Severn Waterway.....	46	Administration building (South).....	107
Distances.....	48	Bridges.....	101
Mileage and general data.....	49	Canal Regulations.....	94
Trent River.....	44	Dimensions.....	91
Trenton (Michigan).....	158	Directions and description.....	102
Bridge.....	158	Dry dock.....	102
Trenton (Ontario).....	44	Guard lock.....	101
Buoys.....	45	Maximum size of vessels.....	100
Eastern Channel.....	45	Mileage and general data.....	92
Leading lights.....	46	Windbreaks.....	102
Wharves.....	45	Weller Bay.....	57
		Weller, Port.....	86, 99
		Canal Administration Building.....	103
		Lights, Fog signal.....	100
		Radio beacon.....	100
		Wharves.....	99

PAGE	PAGE		
Wellington.....	54	Windsor.....	156
Wharf.....	54	Bridge.....	157
Wellington Bay.....	53	Buoys.....	157
Shoals.....	53	Ferry.....	157
Wemps Bay.....	8	Tunnel.....	157
West Dock (Pelee Island).....	142	Winona.....	84
Customs.....	142	Winona Park.....	84
Light, Fog signal.....	143	Wolfe Island.....	10
Western Gap.....	71	Woodtickle Island.....	178
Buoys.....	71	Buoyage.....	178
Ferry.....	72	Channels.....	178
Lights, Fog signal.....	71	Wrecks.....	xx
Wheatley.....	139	Wreck-buoys.....	xx
Harbour.....	139	Wrecks:	
Lights, Fog signal.....	139	Armenia.....	148
Wharves.....	139	Charles B. Packard.....	148
Whirlpool Rapids.....	90	Grand Traverse.....	148
Whitby.....	67	Jay Gould.....	140
Whitby Junction.....	67	Pascall P. Pratt.....	132
Whitby, Port.....	66	Specular.....	140
Buoys.....	66	Wright Bay.....	8
Light.....	66	Wyandotte.....	158
White Island.....	35	Bridge.....	158
Whites Bay.....	14	Caution—pipeline.....	158
Wicked Bank.....	53	Channels.....	158
Wicked Point.....	53	Dry dock.....	158
Breakwater.....	53		
William Shoal.....	17	Y	
Buoy.....	17	Yeo Lake.....	53
Willow Point.....	178	Yorkshire Island.....	15
Light.....	178	Young Cove.....	57
Wilson Bay.....	11	Young Creek.....	130
Windmill Point (Detroit River).....	163	Youngstown.....	88
Light.....	163		
Windmill Point (Lake Erie).....	118	Z	
		Zwick Island.....	41











